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**KO TE KAWA TŪPANAPANA I NGĀ
HAU TŪPUA A TĀWHIRI-MĀTEA**

**The Validation, Revitalisation and Enhancement of
Māori Environmental Knowledge of Weather and Climate**

**A thesis submitted
for the degree
of
Doctor of Philosophy
at
The University of Waikato
by
Apanui Skipper**



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2020

Karakia: Tāwhiri-mātea¹

Ruruku te rangi e Rongo, tēnei te rangi ka ruruku
Piere te rangi e Rongo, tēnei te rangi ka piere
Ngātata te rangi e Rongo, tēnei te rangi ka ngātata.
Tēnei te rangi ka ū, ka māu.
Ko te ruruku i rurukutia ai ko Rangi nui e tū iho nei
Ko te ruruku i rurukutia ai i whatu te ihi, whatu te mana
Tai hohonu te tata, tai karekare te tata
Tikina mai au utaina, ka tere te waka nei
Te taotao kei runga te taotao e Rangi.
Te mātaihia e riri mai rā, e nguha mai rā
Ka turakina, ka romia, ka whakaruhia, ka whakangehea.
Tēnā taotaorangi ka eke i tēnei tua kiato,
Ka eke i a Rauru te tarawa nei i te mātaihia atu
E riri mai nā, e nguha mai nā,
Ka turakina, ka romia, ka whakaruhia, ka whakangehea
Tēnei taotaorangi ka eke i tēnā tua kiato,
Ka eke i a Rauru
Ka āhuru ki te tua i te rangi
Tuatua Ranginui, Rangiroa, Rangipouri,
Rangi-pōtangotango, Rangiwetū mā,
Ki konā koe e tū mai ai,
Me tō ihi, me tō mana, me tō maruaitu
Ka hereherea, ka purupurua te rangi
Ka whanatū au, ka aukaha i te rangi
Ka whatu au, ka purupuru i te rangi
Tūmata te rangi ko koe kei riri,
Whakaamohia te ao ki uta,
Whakangāwaritia te ao ki tai.
Homai he uru!
Ka horahia te moana, kia marino ngā ngaru
Ngaru tarawa, ngaru putuputu.
Horahia mai, marino katoa i tua i Hawaiki
Wero atu taku tao nei, ko Huakinuku,
Ko Huakirangi, ko Ruaiwehea
Takitaki tū te hau e riri mai nei, e nguha mai nei,
E rotu mai nei, he rotu āio, he āio.
Ka whakahuahua i ngā tāngata o runga i ērā waka
E Hou e, Ngātoro e, Kawau e, Toroa e
Kūmea mai te hoe me hoki ki te whetū,
Me hotu ki te marama, ka turuturu ō taringa
Ki te hua mai te tao, ka titoa porututia.
Hui kawā he āio, he āio.
Whano, whano tau mai te mauri o Tāwhiri-mātea
Haumi e, hui e – Tāiki e!

¹ Nahe, 1873, pp. 62-64

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² Weather is the condition of the sky at a particular place over a short period of time

³ Climate is the weather pattern prevailing in a particular area over a long period of time

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Apanui Sonny Skipper

Hereturikōkā 2020

He Tuhinga Whakarāpopoto - Abstract

KO TE KAWA TŪPANAPANA I NGĀ HAU TŪPUA A TĀWHIRI-MĀTEA – THE RITUALISTIC FORMS GOVERNING THE SUPERNATURAL WINDS OF TĀWHIRI-MĀTEA

Mankind have always gazed skyward observing the immense power generated by forked lightning when it strikes the land. The resounding thunder booming across the landscape never failed to capture the awe and imagination of a people. Māori were no different. The legacy of their Polynesian ancestors, who populated most of the Islands of Te Moana-nui-a-Kiwa⁴, the largest ocean on the planet, based on belief, courage and navigational expertise, honed over many millenia, reached Aotearoa approximately in the 12 century. These highly skilled ancestors from the tropics applied a formalised process of settling a new land. It also required their own weatherlore to be recalibrated to the local conditions, in order to survive in a much harsher, colder climate.

Over the centuries the descendants of these early Polynesian settlers, developed an extensive localised knowledge of weather, climate and seasonal indicators to accurately predict daily weather, monthly or annual climate conditions. The ongoing lessons learned especially after experiencing a fatality, were incorporated into cultural practices of important everyday activities such as: ahuwheua⁵, te mahi hī ika⁶, kōhi rongoā⁷, whakaako tamariki⁸, gathering pounamu, whakatū rāhui and kaitiakitanga⁹, in order to minimise further loss of life.

Formal recognition of these contributions was made at the inaugural Māori Climate Forum in Wellington in 2003, where a number of Māori elders highlighted the importance of giving a greater account of Māori knowledge of environmental change. Among the many priorities identified for research at this forum, an opportunity based on a challenge from a Māori elder led to the development of a pilot project to explore traditional Māori understandings of weather–climate variability and change.

⁴ Pacific Ocean

⁵ Agriculture

⁶ Fishing

⁷ Gathering medicine

⁸ Education

⁹ Conservation practice

One of the key outcomes from this work was the identification of Māori environmental indicators to anticipate local weather and climate conditions, and thereby manage the risk associated with weather-climate extremes. However, in spite of the work achieved, there remain unanswered questions about the use and ongoing efficacy of environmental indicators to forecast and monitor weather and climate risks, including how new opportunities might be created to promote learning about subtle signals in nature that can reveal much about changes in weather and climate conditions.

Due to the fact that many of the elders that provided the basis of this thesis have passed away, a great sense of responsibility has remained with me to complete this research. To identify the gaps in the previous research, to ground-truth it, to consolidate and carefully document the level of localised environmental knowledge of weather and climate specifically with iwi from Hauraki-Tainui, Te Whānau-a-Apanui, and Ngāi Tahu. A total of 56 interviews and 17 group wānanga were conducted during 2009-2016. Examples of Māori Environmental Knowledge were also sourced from numerous personal conversations with knowledge holders from 1989-2003, adding to the body of knowledge that was analysed to provide further context. A conceptual framework coined 'Ngā Whenu Tapu e Waru' was created from identifying the key themes of the interviews to inform how Māori Environmental Knowledge was described in the three regions. This study has yielded understandings of wind, rain, thunder, lightning and cloud classifications; weather and climate indicators; spiritual signs of misfortune and death; memory techniques; longitudinal weather predications and lunar calendars in each region.

This thesis is underpinned by a Kaupapa Māori theory and research methodology that links to a body of transformative research and literature conducted by Māori scholars based on the knowledge and experience of tūpuna¹⁰ Māori.

Heoti anō rā kei ngā kākahi whakairoiro, kei ngā matataiko, nau piki mai, nau kake mai ki tēnei wānanga nui whakaharahara.

¹⁰ Ancestor

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Mahere 2: Te Whānau-a-Apanui Rohe (Region)

Mahere 3: Ngāi Tahu Rohe (Region)

He Tīmatanga Kōrero - Introduction

*“Kia whakatau koutou ki a Atutahi-mā-Rehua; ko Atutahi e whakatata nei ki te Mangoroa!¹¹”
– Direct your course to Canopus; Canopus that is by the side of the Milky Way!*

Kei aku nui, kei aku rahi, kei aku whakatamarahi ki te rangi, kei aku whakateitei ki te whenua, tēnā koutou e ngā matāwaka e whakarauika mai nei ki te poho o te kaupapa o Tāwhiri-mātea! Koia nei a Tainui waka, a Aotea waka, a Te Arawa waka, a Nukutere waka, otiā ngā waka huhua o ngā mātua tūpuna e mihi atu nei ki a koutou katoa. Kāti rā, ānei ōku tātai whakapapa¹², mai i ngā kaihautū o ngā waka tūpuna kua whakahuatia, heke iho mai ki au. He tohunga whakaterere waka te tokowhā raka, heoti anō rā me kī pēnei au ki a koutou, he mātanga rātou ki te matapae i te huarere, ki te tiro tiro i te ao o te rangi, kia mōhio ai rātou kei whea rā te ara moana, te ara tika, otiā te ara ora mai i Rai’ātea ki Aotearoa nei.

TĒPU 1.1: HE WHAKAPAPA I HEKE MAI I A TAINUI, AOTEA, TE ARAWA ME NUKUTERE WAKA – GENEALOGY FROM TAINUI, AOTEA, TE ARAWA AND NUKUTERE DOUBLE-HULLED CANOES

HOTUROA TAINUI WAKA	TURI AOTEA WAKA	NGĀTOROI-RANGI TE ARAWA WAKA	TE WHIRONUI NUKUTERE WAKA
Hotuohe	Tāne-roroa	Tangihia	Huturangi = Paikea
Hotumatapu	Ruanui	Tangimoana	Pouheni
Motai-tangata-rau	Whaeatokonui	Kahukura	Tarawhakatū
Ūe-tapu	Wharerua	Rangitakumu	Nanaia
Rakamaomao	Kaokao = Te Koutūoterangi ¹³	Mawake-nui	Porourangi
Kakati	Te Kapungaoterangi	Mawake-roa	Hau
Tāwhao	Houtaepō	Mawake-Taupō	Rākaipō
Whatihua = Ruaputahanga	Ruaputahanga = Whatihua	Tūwharetoa	Manutangirua
Ūenuku-tūwhatu		Rākeihopukia	Hingangaroa
Hotunui		Taringa	Tauārai
Marutūāhu		Tūtetawha	Apanui Waipapa
Tamaterā		Te Rangiita	Rongomaihuatahi
Te Pūtahi-o-Rehua		Parekāwa	Apanui Ringamutu
Te Kiko		Te Kohera	Tūkaki
Tāhae		Pakake-Te-Taiari I	Te Urukakengārangi
Te Poporo		Pare¹⁴ = Te Whata-angaanga	Te Urumahora
Te Whata-angaanga = Pare			Pohēpohē
Tokoahu			Matirerau
Huhurere			Pēti Te Hā

¹¹ Grace (1959) provides this whakatauākī, which refers to instructions given by the priests staying behind to the crews about to leave Hawaiki for Aotearoa (p.36).

¹² Genealogy

¹³ An uri from another wife of Turi called Hinekewa, sister of Hoturoa

¹⁴ Full name is Parewahaika. Married Ngāti Tamaterā rangatira, Te Whata-angaanga, also known as Tūpaea

Ahiataewa Tukukino			Ani
Hunia Te Weu			Whaiora
Tukukino Hunia			Te Atarau
Te Kiriwera Tukukino			Ngāreta
Tairiri II Tukukino			Matetū John Skipper
Rāwene Hemo O'Brien			Apanui Ngāmoki Skipper

Nā, he pepeha tēnei mō tōku matua e whai ake nei:

Ko Whanokao, ko Rangipoua me Tihirau ngā maunga

Ko Mōtū, ko Hāparapara me Whangaparāoa ngā awa

Ko Whakaari te puia

Ko Te Moana-o-Toi te moana

Ko Taura-mai-tawhiti, ko Nukutere, ko Horouta, ko Takitimu, ko Mātaatua, ko Tainui me

Te Arawa ngā waka

Ko Apanui Ringamutu te tangata

Ko Te Whānau-ā-Apanui te iwi

Whanokao, Rangipoua and Tihirau are the sacred mountains

Mōtū, Hāparapara and Whangaparāoa are the sacred rivers

Whakaari is the active volcano

Te Moana-o-Toi is the sea

Taura-mai-tawhiti, Nukutere, Horouta, Takitimu, Mātaatua, Tainui and Te Arawa are the ancestral canoes

Apanui Ringamutu is the eponymous ancestor

Te Whānau-ā-Apanui is the nation

Nā, he pepeha tēnei mō tōku whaea, e whai ake nei:

Ko Moehau-a-waho, ko Te Aroha-a-uta ngā maunga

Ko Waihou me Ōhinemuri ngā awa

Ko Te Moana-Tīkapakapa-o-Hauraki te moana

Ko Tainui me Te Arawa ngā waka

Ko Marutūāhu te tangata

Ko Ngāti Tamaterā, ko Ngāti Hako, ko Ngāti Pāoa, ko Ngāti Porou, ko Ngāti Maru ngā iwi

Ko Ngāti Kiriwera, ko Kāhuiārīki, ko Ngāti Rangitaua, ko Ngāti Taiuru, ko Ngāti Kahuwhitiki ngā hapū

Moehau and Te Aroha are the sacred mountains

Waihou and Ōhinemuri are the sacred rivers

Tīkapakapa-o-Hauraki is the sea

Tainui and Te Arawa are the ancestral canoes

Marutūāhu is the eponymous ancestor

Ngāti Tamaterā, Ngāti Hako, Ngāti Pāoa, Ngāti Porou, Ngāti Maru are the tribes

Ngāti Kiriwera, Kāhuiāriki, Ngāti Rangitaua, Ngāti Taiuru, and Ngāti Kahuwhitiki are the sub-tribes

Ka tika me tīmata pēnei nā, i runga anō i te tikanga Māori, kia mōhio ai, ko wai au, nō whea hoki au. Nā tōku tātai whakapapa, ka mōhio hoki te kaipānui ki taku tūhonohonotanga ki te kaupapa matua. Nō reira ko au tēnei me ōku tūpuna, me ōku mātua hoki, e mihi atu nei ki te ao whānui.

Ā tēnā tātou katoa, it is only correct that I should commence this thesis by introducing myself by connecting my parent's whakapapa to this research, principally through our tūpuna Hoturoa, Turi, Ngātoro-i-rangi, and Te Whironui. Four traditional navigators who mastered the knowledge pertaining to weather and ocean voyaging, understanding intimately this complex traditional wisdom that helped these tohunga whakaterere waka¹⁵ and their crews to voyage across the vast Pacific Ocean, from central Eastern Polynesia to Aotearoa. I included my parents' pepeha¹⁶ to identify where I am from, and to humbly acknowledge the proud legacy of our ancestors, including Māui, Kupe, Ngātoro-i-rangi, and Rakataura, tūpuna of renown who have gone before us. These are our 'giants' who sailed thousands of kilometres across Te Moana-nui-a-Kiwa to Aotearoa so that we could follow in their wake. Nō reira, kei ngā tūpua, kei ngā tawhito, tēnā koutou, tēnā koutou, tēnā hoki tātou katoa.

This doctoral research developed out of a previous study conducted in 2003. I was contacted by a NIWA¹⁷ colleague of mine at the time, Dr. Jim Salinger, and invited to participate in a FRST¹⁸-funded research programme known as 'Adaptation to Climate Variability and Change'.

¹⁵ Traditional Polynesian navigator

¹⁶ Tribal saying that connects an individual to a sacred mountain, river, sea, canoe, eponymous ancestor and a tribe

¹⁷ National Institute of Water and Atmosphere (NIWA)

¹⁸ Foundation of Research, Science and Technology (FRST)

Salinger asked me and another colleague and relative of mine, Darren King¹⁹, to identify at least two iwi participant groups within the Bay of Plenty region to identify and document what they understood of Māori 'traditional knowledge' of weather and climate. However, very limited time was available for this significant undertaking. While I know I have whakapapa connections to many iwi located on Ngā Kurī-a-Whārei ki Tihirau²⁰, the Bay of Plenty coastline, due to the short timeframe we chose to approach Te Whānau-a-Apanui from the eastern Bay of Plenty and Ngāti Parewahaika, a hapū of Ngāti Tamaterā located at Te Ūmangawhā-o-ngā-waka (Colville). As I reflect back on that day, I often think about about those early years and how I entered into a research relationship with these two tribal groups I was affiliated with by whakapapa through my parents. My immediate reaction to that research proposal was anger and frustration due to the unrealistic timeframe. Yet after pausing and taking a breath, I decided to commit to the study because I have always been intrigued by the weather, especially pūrākau²¹ pertaining to weather, and particularly narratives that spoke about tohunga who were capable of manipulating the weather for the benefit of the people. My mother's relation, Ngakoma Ngāmāne, one of the last of my mother's tribal members to be instructed in the traditional manner of our iwi, was known to be able to predict the weather. He also wrote down a lifetime of observations in his diaries, many concerning environmental, weather and climate indicators; a knowledge that had been passed down to him by his elders.

With the arrival of Pākehā colonists in Hauraki, normal practices of disseminating these types of cultural expertise to the younger generation were interrupted²². This PhD research seeks to contribute to the regeneration of MEK transmission in this area of enquiry.

During this project, I thought about another relative from my father's people; a treasured uncle known simply to us as 'Uncle Bill'²³. We spent many holidays with him and his whānau, who on one brilliantly sunny day, without a cloud in the sky, on our own papa kāinga in Omaio, interrupted our conversation to apologise saying that he had to leave and prepare for the

¹⁹ Member of Te Kūwaha and part of the Climate research team based at NIWA Auckland

²⁰ A traditional boundary that commences from Bowentown to Cape Runaway connecting Hauraki iwi to the Mātaatua Confederation of Tribes

²¹ Traditional stories

²² A fuller discussion of the impacts this 'interruption' had on our people is further explored in Ūpoko Tuarima

²³ Proper name is Wīremu Karuwhā Tāwhai from Omaio Bay, Otūwhare – Te Whānau-a-Rūtaia, Te Whānau-a-Apanui

storm that was about to strike the Omaio coastline later on that night. I jokingly said to him, “I suppose you know what time its going to rain tonight too eh?” And he said, “Oh, about 8 o’clock tonight!”

My brother and I, later on, noticed that 8 o’clock came and went. Five minutes later the first rain drops fell, hitting our tent. It didn’t stop raining until four and half days later. Our tent nearly blew down on a number of occasions. Luckily I had anchored it well. I never forgot that night, staring at the blackness in the howling winds and listening to the incessant roar of the moana²⁴.

Although the timeframe for that original project was not ideal, both iwi agreed to work collaboratively with us for the next four years. This was four years of immersing both King and I, in the intricacies and depth of understanding of localised, tacit knowledge of weather and climate. It took me back to Pare Hauraki and Te Whānau-a-Apanui to work closely with my elders. In 2005, Darren King and I with Uncle Bill’s support held a wānanga at Te Wānanga o Awanuiārangi with 15 Te Whānau-a-Apanui elders. A unique opportunity that allowed me to collate significant localised knowledge at a later date. Unfortunately the video footage of the wānanga had gone missing. Luckily for me Liliana Clarke located the video tapes from a former library staff. Much of the Te Whānau-a-Apanui Case Study is based on the interview transcripts.

It was also a journey that took King and I to Japan and Hāwai’i to present the findings of our research project and to meet and discuss with other indigenous peoples; to hear their experiences about the impacts of global warming and climate change and the effects these had on their ability to accurately predict the weather.

In 2009, Dr. Charlotte Severne, who led NIWA’s Te Kūwaha-o-Taihoru Nukurangi²⁵, provided me with the opportunity to undertake doctoral studies based on the initial research conducted with Ngāti Parewahaika and Te Whānau-a-Apanui. She believed that this research warranted further investigation and in order to do this I needed to widen my field of

²⁴ Ocean

²⁵ National Institute of Water and Atmospheric Research (NIWA) Māori Environmental Research Unit

investigation. Initially, I had misgivings, as my colleague Darren King had led the previous study. However after discussing the possibility of ‘scaffolding’ off the original research and receiving support from my colleagues and whānau, I made the commitment. Once committed to being a doctoral student, I found it both stimulating and challenging to grapple with the problems of trying to make sense of this research from a Māori perspective and then attempt to condense such a broad field of enquiry. Trying to understand our ancestors’ abilities without romanticism would not be easy. How to sort out reality from fiction? What were the most important parts? And what could be excluded? Asking these questions forced me to confront more fundamental issues: underlying assumptions about the very nature of the field of enquiry; what we want to know; and the often-unstated yet subtle organising categories in which we conduct our research. This research into Māori environmental knowledge of weather and climate therefore provides an opportunity for me to add my voice to this rarely known body of localised knowledge.

Heoti anō, kei taku atua i te ao kei tua o rangi e Tāwhiri-mātea, ānei tō pononga e tuku atu ana te whakamoemiti, te whakawhetai mō te matātoru o te atawhai otiā ngā hua ka ūwhia mai ki runga ki ahau, hei whakamāramatanga, hei taonga hoki mō ngā uri whakatupuranga kei te haere mai.

Ūpoko Tuatahi: Ko Te Kawa Tūpanapana i ngā Hau Tūpua a Tāwhiri-mātea

RESEARCH QUESTION AND RATIONALE

The purpose of this thesis is to explore Māori environmental knowledge (MEK), expertise, and cultural understandings of weather and climate and determine what currently exists within the Hauraki-Tainui, Te Whānau-a-Apanui, and Ngāi Tahu iwi.

In relation to the overall aim of the thesis, a number of key research questions were developed to guide the research:

- What is the current status of Māori environmental weather (MEK) lore?
- What are the key elements that constitute MEK of weather and climate?
- How does one learn to predict the weather?
- Are traditional weather, climate, and seasonal predictions still reliable and accurate today?
- Has climate change impacted upon MEK of weather and climate?
- Is it possible to influence or change the weather by karakia?

The term MEK is used throughout the thesis with the understanding that MEK is integrated within the broader context of Mātauranga Māori.

A significant limitation, identified early in the research, is the tapu or sacred nature of the subject matter. Various colleagues and relatives of mine have challenged me by asking why would I want to provide a research thesis for academia based on Māori weather and climate? They believe that certain mātauranga²⁶ should remain protected and not accessible to everybody.

However, after long discussions with my pakeke²⁷ and my supervisors, I believe wholeheartedly that the timing is right for MEK of weather and climate to be made available to a new generation of Māori who are ready to explore and expand this body

²⁶ Knowledge

²⁷ Elders

of knowledge from our ancestors that originates and connects us throughout the Pacific. Learned kaumātua²⁸ who are very comfortable and competent about their abilities have led the way for younger generations of Māori to aspire to and acquire MEK of weather and climate.

In the interviews, kaumātua and cultural practitioners raised the issue of the growing disconnection and generation gap between themselves and their mokopuna²⁹ pertaining to the depths of the language, localised knowing, experience, nuance, and skill. A critical tipping point has been reached as far as they are concerned, as many of their children are not interested in learning the age-old traditions of cultural practice (H. Connors, personal communication, February 30, 2010; M. Homes, personal communication, November 15, 2013). Some kaumātua have done something about it, but many have not. Research of this nature may help Māori communities to feel a rejuvenated sense of pride once the findings are disseminated back to them.

The people identified to be interviewed were those with an in-depth knowledge of the weather and climate patterns of their rohe³⁰ and who knew how to predict weather from particular weather and climate environmental phenomena. Those who were skilled³¹ in the arts of karakia³² pertaining to the weather added another important dimension to the research by being able to connect the physical world to the spiritual world. Tribal elders who had lived at a place all their lives, or customary practitioners such as deep sea fishermen, eelers, whitebaiters and titi mutton-birders were ideal participants.

What made them ideal participants? They had learnt not just during their lifetimes, but in many instances from their grandparents' or even their great-grandparents' memories, insights, and local knowledge about the weather. The mere fact that some of these Māori coastal communities live and earn their living in very challenging environments

²⁸ Tribal elders or experts

²⁹ Grandchildren

³⁰ Region

³¹ Cultural practitioners/experts

³² Incantation

like Te Ara-a-Kiwa³³, located in one of the most treacherous stretches of water between the mainland of Te Wai Pounamu and Rakiura, made them ideal candidates to interview.

During my PhD journey, many of the kaumātua who shared their knowledge with us have passed on³⁴. Even during the formative stage of my PhD journey, many ruanuku³⁵ and ruahine³⁶ who were identified as important people to be interviewed, such as John Tahuparae, Ching Te Hau Tutua Nathan, Hohepa Kereopa, Fred Porima, Te Āue Davis, Hone Haunui, and Katerina Te Heikoko Mataira, much to my dismay passed away before I could interview them. The passing of ‘Uncle Bill’ had a particular impact on me. We had a lot of plans for this kaupapa. Hence, the need for this research to be conducted became more urgent.

I still hear the voices of my Te Whānau-a-Apanui elders explaining in heightened tones, recounting what their own pakeke had imparted to them; their shared life experiences and memories. I am so lucky and will always feel privileged to have been a part of their lives and, to some extent, their dreams for this body of knowledge to not only survive but for it to flourish.

ETHICS APPROVAL

This project received Human Research Ethics Approval from what was previously known as Te Pua Wānanga Ki te Ao (School of Māori and Pacific Development) and is currently known as the Faculty of Māori and Indigenous Studies (FMIS). Ethics approval was signed by Ngahuia Te Awekotuku.

THESIS CONVENTIONS

Te Reo Māori is used throughout this thesis. As this thesis is underpinned by a Kaupapa Māori methodological approach, Te Reo Māori is not treated as a second language in its own country of origin but is accorded equal status with Te Reo Pākehā as is required

³³ Foveaux Strait

³⁴ Roka Paora, Wīremu Karuwha Tāwhai, Emma Rodgers-Delamere, Arthur Waititi, Hīria Hedley, Te Awe Davis, Rikiriki Rakena, Toko Renata and Butch McDonald

³⁵ Seer, wise man, priest

³⁶ Seer, wise woman, eldest female from an aristocratic family

under The Māori Language Act (1987). Te Reo Māori is viewed as a taonga; however, I have chosen not to write this thesis totally in Te Reo Māori, as I want this research to have a wider audience than only those individuals who can speak Te Reo Māori. However, in order to respect the essence of the knowledge shared in Te Reo Māori and retained by kaumātua, Māori text is left in its original state. With some words that have the same written form in both English and Māori, like 'take' or 'mate', care is taken to ensure that there is no ambiguity. Explanations are given when different dialects are used, such as Te Whānau-a-Apanui and Ngāi Tahu; otherwise Tainui is the default dialect used throughout the thesis. Although the majority of the text is written in English, some parts of the thesis discussion are conducted in Te Reo Māori to facilitate a more accurate account, especially with regard to the iwi in which the kōrero was sourced. I am very mindful of the fact that the thesis will be accessible to a wide audience but I am even more mindful of being sensitive to the iwi of the interviewee and ensuring that their mātauranga is shown in the most acceptable and respectful manner. Therefore, although English is the primary language used, Te Reo Māori is also used throughout this thesis as the best way of providing a more balanced approach to this type of research.

THESIS OUTLINE

He Tīmatanga Kōrero (Introduction): Is a personal introduction to connect myself by whakapapa to this research, including outlining the genesis of this doctoral thesis.

Ūpoko Tuatahi (Chapter One) Ko Te Kawa Tūpanapana i ngā hau tūpua a Tāwhiri-mātea: Places the thesis within a Māori research paradigm, proposing that this body of research provides a wider context for researching and theorising by including a central-Eastern Polynesian component. The key research questions, rationale and justification for this thesis are explained. This chapter also outlines the conventions that provide guidance throughout the thesis. It includes a discussion of the methodology that underpins this enquiry, the methods used to best understand the nuances and subtleties of meaning, and the significance of using a Kaupapa Māori theory and research methodological approach.

Ūpoko Tuarua (Chapter Two) – Te Ao-o-ngā-atua: This chapter grounds the thesis in a purely Kaupapa Māori methodology. It explores the known literature recording Māori creation narratives specific to this kaupapa. Of special interest is the weather god Tāwhiri-mātea and his progeny, who are incensed with the other atua responsible for separating Ranginui and Papatūānuku, the primordial parents. These traditional narratives will rationalise the reason why there is an eternal conflict between mankind and extreme weather events.

Ūpoko Tuatoru (Chapter Three) Mātauranga Taiao Taketake Huareretanga – Ethnometeorology of Indigenous Environmental Knowledge: There is a distinct lack of literature on Māori traditional weather and climate knowledge, therefore another approach was needed to provide a basis from which to critique what little relevant literature is on offer. Ethnometeorological knowledge; the indigenous environmental knowledge of weather and climate from around the world, was reviewed to identify the most important issues and new insights. This chapter will also comment on the similarities and the discrepancies in information between Pākehā ethnographers and their Māori sources from the late nineteenth to the twenty-first century.

Ūpoko Tuawhā (Chapter Four) Aotearoa – A New Beginning: This chapter incorporates two themes: (1) A review of the literature about our Polynesian ancestors. The review explores the proud legacy of the Lapita people, a fisher folk who sought new lands after losing their coastal villages to rising sea levels. The weather and navigational knowledge that evolved over many millenia, developed out of braving the vast expanse of Te Moananui-ā-Kiwa, was unparalleled for its time. The skill levels of these intrepid ancestors are used as an exemplar. (2) An examination of how these ancestors adapted and adjusted to a new, colder climate in Aotearoa during the settlement phase. The reasoning of establishing a whare wānanga or religious learning institution is also explored. However, I will not be spending much time exploring the whare wānanga universe. Only enough to provide a context of its utmost significance to this thesis.

Ūpoko Tuarima (Chapter Five) Impacts of Colonisation: Examines the impacts of colonisation on traditional Māori epistemology, dissemination and teaching

establishments, but more specifically on Māori environmental knowledge of weather and climate. The literature is reviewed, particularly the Tohunga Suppression Act, to better understand the significance of the interruption and the consequences of that loss on traditional Māori values and practices.

Ūpoko Tuaono (Chapter Six) Mātauranga Taiao Māori – Māori Environmental Knowledge of Weather and Climate: This chapter describes what Mātauranga Māori means in the context of this thesis. Next it introduces 'Māori environmental knowledge' of weather and climate. A conceptual framework is then explained, detailing the eight key elements of MEK coined Ngā Whenu Tapu e Waru or the 'Eight Sacred Strands'. Further clarification is given on each one of the eight components, including examples to demonstrate why it has been identified as being a core part of this thesis. This conceptual framework was developed in order to better understand the complex nature of weather and climate, and to assist the practitioner's accuracy predict the weather.

Ūpoko Tuawhitu (Chapter Seven) Wāhi Rangahau Tuatahi - Hauraki: A case study approach involving three iwi: Hauraki-Tainui, Te Whānau-a-Apanui, and Ngāi Tahu. Ūpoko Tuawhitu introduces the first case study: Hauraki-Tainui iwi. Most of the participants involved my own immediate whānau, who are kaumātua of the Marutūāhu confederation of iwi (Ngāti Tamaterā, Ngāti Maru, Ngāti Pāoa, Ngāti Whanaunga).

One on one semi-structured interviews were conducted with kaumātua (13) at their homes. An extensive literature search was conducted in parallel with interviews to elicit relevant information in order to populate the eight principal strands of MEK.

Ūpoko Tuawaru (Chapter Eight) Wāhi Rangahau Tuarua - Te Whānau-a-Apanui: The next case study was located within the eastern Bay of Plenty rohe with Te Whānau-a-Apanui iwi. This chapter is based on the previous research led and conducted by Dr Darren King and I, but in collaboration with Bill Tāwhai. Tāwhai invited many of his relatives to assist and support this research project to its conclusion from 2003-2006. The research involved 19 kaumātua. Unfortunately due to the passing of my PhD mentor Tāwhai in 2010, my aspirations to revisit identified gaps in the previous research as a

PhD candidate did not occur. Tāwhai had a clear idea about what I should do in order to fulfil the requirements of a PhD on Te Whānau-a-Apanui weatherlore.

Suffice to say, if it was not for the assistance of Liliana Clarke finding the video tapes of the group interview of the two-day wānanga that was held at Te Wānanga o Awainuiārangi in 2005 of these Te Whānau-a-Apanui kaumātua (15), I would not have had the opportunity to complete the Te Whānau-a-Apanui case study. A 30,000+ word transcription treasure trove of Te Whānau-a-Apanui weatherlore, a legacy left by Uncle Bill to his nephew to complete his PhD.

Ūpoko Tuaiwa (Chapter Nine) Wāhi Rangahau Tuatoru – Ngāi Tahu: This chapter reports the outcomes of 40 interviews conducted with Ngāi Tahu whānui elders and cultural practitioners, across Te Wai Pounamu. Funding secured from Deep South National Science Challenge allowed me to complete my initial research started in 2010.

Ūpoko Tuangahuru (Chapter Ten) He Kupu Whakamutunga - Key Findings and Recommendations: Addressing the key research questions posed in Ūpoko Tuatahi. Whether or not MEK of weather and climate still remains relevant to Māori society is considered and a final evaluation is offered, including opportunities for further research.

METHODOLOGY

Deciding on an appropriate methodology relevant to Māori research is totally dependent on the researcher having the prerequisite skills, and in this case skills consistent with a Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu worldview. A Māori worldview simply means that Māori have a particular way of viewing the world, which is usually framed within a whakapapa or a genealogical construct to better understand complex relationships, especially within nature. Therefore this research study is positioned within a Māori inquiry paradigm, using a Kaupapa Māori methodological approach (Smith, 1997; Smith, 1999; Pihama et al., 2002).

Kaupapa Māori Theory and Research Methodology

The notion of reasserting Māori aspirations and cultural practice grew out of the formative years of the Te Kohanga Reo Movement, the creation of the Waitangi Tribunal and other forums of Māori activism (Smith, 1999:172). A core group of leading Māori academics (Dr Katerina Te Heikoko Mataira, Dr Pita Sharples, Professor Linda Tuhiwai Smith, Deputy Vice-Chancellor Māori Graham Hingangaroa Smith, Tuakana Nepe, Associate Professor Leonie Pihama, Dr Kathy Irwin, Dr Taina Pohatu, Toni Waho), created Kaupapa Māori theory to validate and legitimise Mātauranga Māori (p.172). Dr Kathy Irwin (1992) argues that:

We don't need anyone else developing the tools which will help us to come to terms with who we are. We can and will do this work. Real power lies with those who design the tools – it always has. This power is ours (as cited in Smith, 1999, p. 38).

Professor Linda Smith, author of *Decolonising Methodologies*, arguably the seminal written work on Kaupapa Māori to date, states that at its most fundamental level theory, like Kaupapa Māori, helps us make sense of our reality, and creates a space to strategise how to achieve greater control (1999, p.38). Kaupapa Māori is therefore essentially an emancipatory theory that has evolved out of the collective frustrations of Māori knowledge systems being marginalised, ignored or simply not viewed as real knowledge (Eketone, 2008, p. 9; Mahuika, 2008, p. 4). According to Smith (1999), “the process of colonisation can be viewed as a stripping away of mana (our standing in our eyes), and an undermining of rangatiratanga (our ability and right to determine our destinies) (p.173). This is the context in which Kaupapa Māori theory was born, in order to ‘push back’ against generations of entrenched institutional racism. From those early beginnings there is now a considerable amount of literature on Kaupapa Māori theory available to a wider audience nationally and internationally (Mahuika, 2008; Penehira, 2013, 2014; Cram et al, 2000; Eketone, 2008; Pohatu, 1996; Nepe, 1991; Bishop, 1996; Pihama, 1993, 1997, 2001, 2005, 2010; Smith, 1997; Smith, 1992, 1996, 1999, Taki, 1996; Mane, 2009).

The following Kaupapa Māori research principles underpin the work undertaken in this thesis (Smith, 1999, p. 120):

- Te Reo Māori me ōna Tikanga (The use of the Māori Language and protocols)

- Aroha ki te tangata (To show affection to people, greeting)
- Kanohi kitea (Seen face – Be seen, take responsibility for your project)
- Kaua e whakahē te kōrero (Don't refute what is being said)
- Manaaki tangata (Reciprocate, entertain, be the ideal host)
- Te mana o te tangata (Acknowledge people as your equals)
- Titiro, whakarongo, kōrero (Watch, listen, and then make a comment)
- Whanaungatanga (The importance of relationships-genealogy)
- Kia tūpato - (Be cautious always)
- Kaua e whakanui i a koe anō (Remain humble at all times)

Seven of the above values were sourced from Smith (1999, p. 120). I have added other values that reflect the researcher's ability to know the Māori world. These 10 principles provide the guidance required to structure the research in a way that is acceptable to whānau, hapū and iwi of Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu. These principles are applied through an observance of tikanga Māori and recognition of the rights, aspiration, values, interests and sensitivities of the participants involved in the research (Smith, 1990; Te Awekotuku 1991; Smith, 1999; Pihama et al., 2002). Kaupapa Māori theory therefore is about reclaiming our collective voices, our collective worldviews, and our collective mana.

A close relative and colleague of Linda and Graham Smith, Tuakana Nepe (1991) argued that:

Kaupapa Māori Knowledge places its origins in Rangiātea, which she states is exclusively Māori. Rangiātea is the first known Whare Wānanga (Higher house of learning) located in Te Toi-o-ngā-Rangi (this refers to the upper level of the spiritual realm), the home of Io-Matua-Kore (the creator) (as cited in Pihama, 2015, p. 7).

Tuakana Nepe continues by giving a clear understanding of what she believes constitutes Kaupapa Māori theory, by stating that it is grounded in Māori knowledge, which is ancient, and has been conceptualised within the whare wānanga institutions. She also argues the key differences between Māori Knowledge and other epistemologies:

Māori knowledge is not to be confused with Pākehā knowledge or general knowledge that has been translated into Māori. Māori knowledge has its origin in a metaphysical base that is distinctly Māori. Kaupapa Māori is esoteric and tūturu Māori. It is

knowledge that validates a Māori world view and is not only Māori owned but also Māori controlled (p. 17).

It is from this strong spiritual base that Nepe describes Kaupapa Māori as being:

Derived from very different epistemology and metaphysical foundations and it is these which give Kaupapa Māori its distinctiveness from Western philosophies. In other words, there is more to Kaupapa Māori than our history under colonialism or our desires for self-determination. We have a different epistemological tradition which frames the way we see the world (as cited in Smith, 1999, pp. 187-188).

In other words, Smith and others have created this theory to normalise and to reaffirm what it is to be Māori working within a pre-dominantly Pākehā environment, such as mainstream academia (Pihama, 1993). Numerous research projects have now been conducted using Kaupapa Māori as an intervention strategy for the transformation of Māori communities. The use of Kaupapa Māori methodology means this thesis has been researched using a purely 'Māori' lens (Mane, 2009; Mead, 1996; Pihama, 1993, 2001; Smith, G.H., 1997). The validation, revitalisation and enhancement of MEK of weather and climate is well suited to this type of enquiry as it seeks to examine the complex nature of the weather from a purely Māori perspective.

Although many Māori scholars have agreed that academic institutions might not be the appropriate place to conduct tūturu³⁷ Māori research, some still believe that there are benefits to 'holding the line' to ensure a strong advocacy for Māori-based research remains within predominantly white tertiary learning institutions. According to Pihama (2015):

Māori students across the country have been told by Pākehā supervisors it is not sufficient to reference Kaupapa Māori theory as their theoretical framework or to rely solely on the writings of Māori academics when discussing issues regarding Māori education. It is clear that those Pākehā academics, some of whom are supervising Māori students at Graduate level, are unable to accept that Kaupapa Māori theory is a valid theoretical framework or that Māori are able to develop theoretical frameworks that have origins in te reo and tikanga Māori. This is a particularly ethnocentric notion, yet it continues to pervade the academy in ways that can seriously disadvantage Māori staff and students. Such dilemmas for Māori academics and Māori students have been documented over the past twenty years as a means of continuing to challenge the institutional racism that underpins that ongoing marginalisation of Māori knowledge (p.12).

³⁷ Authentic

To conclude, Pihama highlights that Kaupapa Māori theory is essentially an indigenous theory of change:

What is important is the understanding that Kaupapa Māori theory is founded within the knowledge that derives from the learning, experiences, understandings, worldviews, values and beliefs that are ancient. These forms have been handed down through generations, and although disrupted and disregarded through colonial impositions they have survived to continue to inform how we are in the world. Kaupapa Māori theory is developed from as foundation of Kaupapa Māori and mātauranga Māori. Its base is firmly entrenched on Māori land, on Papatūānuku, and that holds Kaupapa Māori theory as a distinctive framework (Pihama, 2015, p. 13).

Nearly four decades of Kaupapa Māori research have been conducted to date to educate a non-Māori audience. Linda Smith believes that there is still more work to be done by being more careful in the way ideas and definitions are presented to a non-Māori audience (2015:49). Smith continues by asserting that non-Māori are not the only ones that need educating; so are Māori, to better prepare ourselves to use proper research skills (p.49). One of the key research skills required by Māori using a Kaupapa Māori methodology, while working collaboratively with iwi, is understanding the differing concepts and ideas based on tikanga Māori that ground us as Māori researchers. Smith (2015) has definite ideas about how to take Kaupapa Māori research to another level.

These ideas are important because they provide a conceptual framework and signal standards of excellence to which Maori research must aspire. These ideas are contained within the language but are often manifested in the taken for granted behaviours of Maori people. For example:

- (i) *Why do we seek out kaumatua?*
- (ii) *Why do we value wānanga as a shared learning process?*
- (iii) *Why do we stay up late at night to listen to kōrero?*
- (iv) *Why do we have karakia?*
- (v) *Why do some of us talk about 'holistic' views?*
- (vi) *What is wairua and what does wairua do?*
- (vii) *Why is tapu important and how is it linked to knowledge?*
- (viii) *Why does a Maori researcher want to feed his/her visitors?*
- (ix) *Why does a Maori researcher want to hold a hui or take an issue to the marae?*
- (x) *What does utu, koha, manaakitanga mean(pp. 51-52)?*

These are some of the many ideas that Māori researchers need to consider and understand in order to take Kaupapa Māori to the next level. If they do not, then they need to seek mentorship to do so. Most importantly, this is an example of how Māori researchers can empower their iwi partners too, to be enablers and to be able to work together to truly realise iwi research aspirations.

RESEARCH METHODS

This section provides details of the range of qualitative research methods used in the first phase of this enquiry to collate a suite of information about localised Māori environmental knowledge of weather and climate from Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu iwi. But before that, further clarification is required in order to better understand my role as principal researcher. In 2009, a successful application for seed funding was made within NIWA to secure funds to support my doctoral research. This funding allowed me to initiate the first part of my research plan, to interview kaumātua and practitioners from the three iwi. Unfortunately, due to another research commitment, namely Waikato River Scoping Study (WRISS) and the passing of Uncle Bill, I put my Doctoral studies aside temporarily to reassess what I was going to do without Uncle Bill's guidance and wisdom.

Hence the research methods undertaken to complete the collation of interviews with Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu. The main methods included:

- 17 semi-structured, open-ended group interviews with a mixture of kaumātua and cultural practitioners such as a tangata mahinga kai³⁸;
- 56 semi-structured, open-ended one-on-one interviews with specialist key informants, and;
- personal observations and whikoi within the rohe of the participants.

The research team involved the doctoral candidate (primary interviewer), another Te Kūwaha colleague³⁹ to assist with taking notes, setting up and checking the dictaphone, and in the Ngāi Tahu case study only, a sub-contractor who recorded the interviews using a video camera.

³⁸ Only one Te Whānau-a-Apanui participant was interviewed one on one, the rest were interviewed using a group interview approach.

³⁹ As Darren King and I had started this kaupapa back in 2003, I organised with him to accompany me on my travels especially down to Te Wai Pounamu. I included my colleague Mandy Home too as she had the iwi networks to organise hui

Each iwi participant group required a research facilitator. The facilitator was responsible for organising the hui and the venue, following up with participants who had not confirmed their attendance, and preparing light refreshments. The majority of the participants were identified and invited to participate in this research programme through existing whānau, hapū, iwi and research networks, prior to the interviews.

There were three ways of recording the interviews to ensure all information was captured, provided consent was given. These involved the use of a video recording camera, a dictaphone and taking clear notes. This ensured that the information that was shared with the research team was captured in the unlikely event of equipment failure. Face-to-face interviews can be very expensive; you only get one chance at getting it right. Hence, it was important to ensure that the interviewees were comfortable, which meant that in most cases the interviews were undertaken on their marae or in the privacy of their own homes. Often these locations added to what was being shared. Carvings, photographs and paintings influenced the flow of the discussion.

Aerial and topographic maps were used to assist with location and explanation of customary activities and environmental indicators. The research team realised that this style of mapping differs from conventional digital mapping in terms of accuracy because it is concerned with oral narratives and observations that are attached to the whenua in specific locations.

Interviews lasted approximately 1.5 - 2 hours each. These three consultation methods ensured that a good cross-section of insights, views, experiences, skills and local, tacit knowledge of the rohe were obtained.

Group Interviews

Where possible the group interviews were held in a whare tūpuna. Before group interviews were conducted, a mihi whakatau was given by a local kaumātua or by the research facilitator, followed by a whakawhanaungatanga exercise to allow participants to introduce and connect themselves to the marae, to the rohe and to the kaupapa.

To do this, participant consent forms were handed out to all interviewees to sign before commencement, after being briefed about what the research study entailed. The signature also gave the researcher permission to use all images and video recordings to create vignettes as educational tools. The research facilitator chosen was a person well known by all the participants. It is really important to get this part right, to ensure that the right person is well connected to lead this part of the research. This is critical to the overall success of the research. If the research facilitator is a person without mana or standing within the community the participants will more than likely not be as forthcoming nor supportive. The role and responsibilities of a facilitator are to:

- get the participants to the venue, on time;
- create an atmosphere in which all feel comfortable to share their thoughts;
- elicit and stimulate discussion;
- keep the discussion on the kaupapa;
- encourage all interviewees to participate;
- ensure there is no abuse or intimidation.

Group interviews are an excellent way of gauging consensus of opinion within a community, particularly from the point of view of shared experiences, where interviewees can respond to thoughts and ideas. However, whānau, hapū or iwi dynamics are real. Some participants with less confidence did not contribute if certain individuals dominating the discussion were in the same room, and were speaking. Hence it was important to have clear facilitation of each group and to listen to what was said and more importantly, what was not said. It was also important to be attentive to participants' body language. It is important to note the difficulty inherent in recording a group interview with regard to audio clarity, especially if there are more than 6-9 participants. Multiple people trying to speak at the same time make it very difficult for the transcriber to hear clearly enough, especially when the participants are passionate about the kaupapa. This is where the research facilitator is so important, to keep participants on track and also to encourage respect for each other's opinions by not interjecting. Organising kaumātua or cultural practitioners to attend research interviews in one space is not easy, so extra care needs to be taken to ensure that everyone is given the respect and opportunity to have their say.

Aerial and topo maps of the rohe were made available to the group if needed to identify significant sites and places of change. This proved to be an effective technique to gain a better understanding of local weather phenomena, due to the location-specific nature of the kōrero provided.

At the end of each session, participants were asked if they could identify anyone else who they believed should be invited to participate⁴⁰.

Once the interview draws to a close, the interviewer offers a mihi to the participants and a karakia conducted by the home people concludes the hui proper. Following the interview, all participants are invited to finish the hui properly by having a “cuppa tea and a kai”. Some of the best leads identifying other potential interviewees have taken place over a “cuppa tea”. Further in-depth kōrero almost always takes place while having a kai. These informal discussions are known as cuppa tea interviews.

One-on-one Interviews

One-on-one semi-structured open-ended interviews followed a similar format, but differed from group interviews as they did not involve a research facilitator during the actual interview. The criterion to be identified as an interviewee for one-on-one interviews was simply being knowledgeable about local weather, climate and/or seasons. Tangata mahinga kai who were specialists in harvesting practices such as eeling, whitebaiting, tītī mutton birding, fishing, or diving were ideal. These cultural practitioners had an intimate, in-depth, localised knowledge about the right season, the right lunar phase, and the right weather conditions to catch, gather, or harvest these taonga kai.

⁴⁰ There was an unspoken understanding amongst the research team to “*open ones self to the kaupapa and see where it takes you*” (D. King, personal communication, August 31, 2006). Countless times in the past, my Te Kūwaha colleagues and I have taken this approach when conducting interviews with kaumātua or a Māori community they have just met just to be told they need to speak with another member of the iwi, who is the person you need to speak with.

Then there are kaumātua who, like Wīremu Tāwhai, have been brought up knowing what to look for; how to be observant; the effect of the moon; and how to predict short-term and long-term weather by carefully looking for environmental indicators, precursors of changing or inclement weather on the way. Unfortunately there are very few tribal elders remaining who know how to do this; nor do many know appropriate karakia associated with the weather. These interviews were used to identify and examine in more depth the participants' beliefs, local knowledge, customs, and in many cases life-long experience in their rohe, and how the weather and climate had impacted upon their communities from each individual's perspective.

The research facilitator organised the venue, dependent on the participant and where they preferred to hold the interview. Any key issues, insights or common themes that had emerged from the group interviews were included in the list of research questions. Opportunities to visit mahinga kai areas were sometimes organised to view first-hand where traditional harvesting took place, including where weather phenomena occurred. This enabled the capturing of diverse localised knowledge within whānau, hapū and iwi, which was a key component of the research. Using the aforementioned mapping exercise also recognised that visual depictions such as photos and especially maps are an essential tool for communicating with iwi.

Interview collation and analysis

Once interviews were completed, they were transcribed and collated. The analysis involved a three step process:

1. Content analysis technique was employed focusing on the activities of the hāpori (whānau, hapū and iwi) such as karakia, cultural practice and traditions.
2. Then thematically analysed in order to allow for a detailed description of the data.
3. Lastly, cross-checked if needed with the participants to ensure the integrity of the key ideas and interpretations.

Each individual participant was given the option of whether or not they wanted their own transcriptions and recordings back. At the completion of the research all data was removed from the researcher's computer server and a full summary of the research findings was provided to all participants.

In the Ngāi Tahu case study only, the best vignettes were identified from all the video recordings. These vignettes were categorised as: (i) weather indicators; (ii) climate indicators; and (iii) climate change observations.

HE WHAKARĀPOPOTOTANGA - SUMMARY

Ūpoko Tuatahi has introduced my thesis, the key research questions, the rationale for undertaking this thesis, the research methodology employed, and the method used to collate all the data in order to undertake MEK of weather and climate kaupapa.

Ūpoko Tuarua will explore Te Ao o ngā Atua Māori, to explain alot more fully, the deep importance Māori placed on their creation narratives to better understand how Māori viewed the natural world including how they fitted into that world as well.

Ūpoko Tuarua: Te Ao o Ngā Atua Māori

TE ŌROKOHANGA-O-TE-AO – THE CREATION OF THE WORLD

*Ko lo-nui, lo-roa, lo-matua, lo-matua-kore
Ko lo-matamoe, lo-matakakā, lo-matanui, lo-matangaro
lo-mataaho, lo-urutapu. lo-pūkenga, lo-wānanga
lo-ītanga, lo-te-whiwhia, lo-te-rawea, lo-taketake
Ko Te Kore
Ko Te Kore-tuatahi, ko Te Kore-tuarua
Ko Te Kore-tuatoru, ko Te Kore-tuawhā
Ko Te Kore-tuarima, ko Te Kore-tuaono
Ko Te Kore-tuawhitu, ko Te Kore-tuawaru
Ko Te Kore-tuaiwa, ko Te Kore-tuangahuru
Ko Te Kore-tuangahuru-mā-tahi
Ko Te Kore-tuangahuru-mā-rua
Te Kore-te-whiwhia, Te Kore-te-rawea
Te Kore-te-tāmaua, Te Kore-te-tāngare
Te Kore-tūāpapa, Te Kore-tūārangi
Te Kore-te-pō, Te Kore-te-ao
Ko Te Whakamatūtanga
Ka matū, ka whāoko, ka pīere, ka mā tata, ka ngāwha, ka ngāora, ka pū
Ko te pū, ka more, ka weu, ka aka, ka rea, ka wao, ka kune, ka whē, ka tau
Ko Te Iho-taketake, ko Te Iho-matua-a-Ranginui-e-tū-iho-nei
Ko Te Iho-marie-a-Papatūānuku-e-takoto-ake-nei
Turuturu whakawhiti maua kia tina, Tina. Haumi e, hui e, tāiki e
(Winitana, 2014, p. 6)*

HE TIMATANGA KŌRERO - INTRODUCTION

The purpose of this chapter is to introduce the extant knowledge about 'Te Ao o Ngā Atua Māori' or The World of the Māori Gods, in particular atua who are the personifications of weather phenomena, to establish their presence and their significance within this thesis. Te Ao o Ngā Atua Māori is an important component of the thesis as it provides the reader, a platform to better understand our ancestors' belief about how the universe was created and the role of Tāwhiri-mātea within that narrative.

Indigenous narratives about creation have preoccupied first nations peoples worldwide. Every culture has developed a cosmological explanation of the origin of life, the forces of the natural world and mankind's position within that environment (Harmsworth & Awatere, 2013, p. 274).

These creation traditions take numerous forms, often reflecting an intimate and a spiritual connection between people and their environment. Māori are no different. An investigation of the creation narratives and the Māori gods brings with it new insights into Māori cosmology. Despite a plethora of literature, the current collective works suggest that past research in Aotearoa has been far from objective or complete. The main focus of this part of the chapter is to identify the gods associated with weather phenomena and the roles they played in the creative narratives of the Māori (Walker, 1992, pp. 170-182).

Māori have many oral creation stories. Creation narratives are usually regarded as a sacred, cosmological account that has arisen from deep contemplation and careful observation by Māori ancestors of the biological rhythms of the natural world (Best, 1898, 1924, 1972, 1976, 2005; Cowan, 1930; Cruikshank, 1998; Jones, 2013a, 2013b; Marsden, 2003b; Paraone, 1907; Royal, 2002, 2003b; Smith & Whatahoro, 1910; Smith, 1913; Thornton, 2004; Tikao Beattie, 1990; Walker, 1990; Winitana, 2014).

Most Māori creation stories share some common themes. The first involves the holistic way Māori believe that all things are related stemming from the whakapapa or genealogical recital from the first state of existence known as Te Kore or The Void of Nothingness. This nothingness from a Māori perspective was not perceived as a non-Māori would understand nothingness, but as a time of great contemplation, a time of latent potential (Walker, 1990, p. 11). This was followed by a period known as Te Pō and then by Te Ao Marama known as the World of Light. It is a whakapapa or line of descent, from one state of being to another, an evolution from a period of nothingness progressing over eons to the emergence of light.

Mikaere (2011) calls into question some of the interpretations of these creation narratives: “the single most important message to emerge from our creation stories is that we are connected, by whakapapa, to one another and to all other parts of creation” (p.313). With this in mind, what affects one part of that whakapapa ultimately affects the whole. This is why Māori take the responsibility of looking after the environment in a sustainable way, known as kaitiakitanga, seriously. In a Māori way of thinking, there is

always a negative consequence, a form of *utu*, if mankind fails to take these duties seriously.

The second theme involves one of the most well known creation narrative, the separation of Rangi-nui, sky father, and Papatūānuku, earth mother. The first known *wānanga* was held amongst the children of Rangi and Papa to find a way to improve their cramped living conditions. They reached a consensus to separate them⁴¹. The majority of the Māori creation *pūrākau* involves this primordial act; a necessary task in order to allow their offspring enough space to develop, grow and procreate. The underlying message is clear: if you continually live with your parents you run the risk of stifling your personal growth. To obtain new and innovative knowledge one needs to venture out from the warm, comfortable, known confines of one's 'parents' and embrace the challenge of the unknown. Only then can true enlightenment, intuition and wisdom based on life experience be attained.

The third theme explains how each *tamaiti*⁴² of Rangi and Papa helped to create the natural world of the Māori, and these came to be known as *Ngā Atua Māori* or the Māori Gods. It is very easy to believe that many of the offspring of Rangi and Papa were male based on the plethora of literature available (Best, 1972; 1976; 2005; Smith, 2011; Anderson, 1969; Buck, 1950; Cowan, 1930; White, 1888). However, Dr Aroha Yates-Smith and other female academics have argued for the inclusion of female *atua*, such as Hineahuone, Hinetitama and Hinenuitepō and many more (Yates-Smith, 1998; Murphy, 2013; Gabel, 2013; Simmonds, 2014). Suffice to say that this is yet another example of the impacts of colonisation on traditional Māori narratives where the coloniser privileges the male over the female. Examples of female *atua* will be discussed later in this chapter.

Ngā Atua Māori numbered seventy or more, and each had his own domain and functions (Best, 1982, pp. 75-76; Smith et al, 2011, p. 118; Tapsell, 1997, p. 327; Buck, 1974, pp. 454-457). The following are the key Māori gods:

⁴¹ A more fuller account of the separation will be explained later on in the chapter.

⁴² Child

TĒPU 2.1: NGĀ ATUA MĀORI – THE MĀORI GODS

NGĀ ATUA MĀORI	NGĀ MANA WHAKAHAERE
Whiro	The god of misfortune, darkness and death
Tangaroa	The god of oceans, seas, rivers, lakes and all life within them
Tāwhiri-mātea	The god of winds and tempests
Tāne-mahuta	The god of the forests and all living things within them
Tūmataunga	The god of warfare and of mankind
Rongo-mā-Tāne	The god of cultivated foods – kūmara and the god of peace
Haumia-tiketike	The god of fern roots and other wild foods
Rūaumoko ⁴³	The god of earthquakes and volcanoes

Winitana (2014) had this to say about Tāwhiri-mātea as the principal atua of the sky, and the principal atua of this thesis:

Ko Tāwhiri-mātea nāna te hauora o te tangata. Kei ngā pūkahu o te tinana o te tangata e noho ana. Nāna hoki ngā hau o te ao. Nō tana rerenga atu ki te rangi i puta ake ai te ātea o te rangi. Nāna ka puta ko ngā tini hau o te ao. Kei roto i Te Ahoaho o Te Rangi ia e noho ana. Ko tana pākuru he whatitiri, ko tana whao matarau he uira, ko tana papa whakairo ko te mata o Papatūānuku. E kīia ana te kōrero: ‘Kua whakairohia te whenua e ngā hau a Tāwhiri-mātea. Ko ngā wawata ko ngā tūmanako ko ngā hihiri hoki o te hunga tangata kei ngā haenga e mau ana. Whāia atu rā!’ (p.38).

Tāwhiri-mātea is responsible for carrying the oxygen we breathe. He resides in the lungs of our bodies as well as the atmosphere. When he flew up to his father he produced the space of the sky. He made the plethora of winds of our world. He lives at The Filament Of The Sky. The thunder is his hammer, the lightning his chisel as he carves the face of the earth. As the words go: ‘The land has been carved by the winds of Tāwhiri-mātea. The dreams and aspirations of mankind are held within his etchings. Follow them’ (p.76).

From this discussion the narrative begins to consider the need for a female element in order to procreate and therefore provide a more diverse selection of fauna and flora. Tāne and his brothers created the first woman, Hineahuone, by producing the female element and therefore the ira tangata (physical essence).

This element produced at Kurawaka gave spiritual beings the ability to have a physical body. Wairua (spirit) derive from the words, ‘ngā wai e rua’ or the ‘two streams’, one male and the other female. Therefore Māori viewed themselves as descendants of the

⁴³ Also known as Rū-ai-moko / Rūaimoko

gods and consider the mountains, streams, forests and oceans as personifications of the gods and also as their elder brother or sister (tuākana) to Humankind. There are many tribal versions of the three themes that have been described. Through these creation narratives, iwi are able to express their values, what is significant to them and why. This helped them understand their place in their environment and also how they should behave within these relationships (Royal, 2010). There is an extensive corpus of written text about Māori creation narratives. The following examples are creation stories that are sourced from Ngāti Raukawa, and Mātaatua.

TE TAKENGA MAI O TE AO – THE ORIGINS OF THE WORLD

Ngāti Raukawa Creation Story

Te Pō (Night, darkness)
 Te Pō-nui (Great night)
 Te Pō-roa (Long night)
 Te Pō-whāwhā (Night of touching)
 Te Pō-te-kī (Night of low sound)
 Te Pō-te-rea (Night of murmuring sound)
 Te Pō-i-a-Hineruaki (Night of Hine-disgorging)
 Te Pō
 Te Ata (Dawn)
 Te Ao (Light)
 Te Ao-tū-roa (Long standing world)
 Te Ao Mārama (World of light)
 Aituā (Calamity, misfortune)
 Te Kore (Void)
 Te Kore-tuatahi (First void)
 Te Kore-tuarua (Second void)
 Te Kore-nui (Great void)
 Te Kore-roa (Long void)
 Te Kore-para
 Te Kore-tē-whiwhia (Unobtainable void)
 Te Kore-tē-rawea (Untouchable void)
 Te Kore-tē-tāmaua (Void that can not be grasped)
 Te Mangu Māhoranuiārangi
 ┌───────────┴───────────┐
 | |
 Tokomua Tokoroto Tokopā Rangipōtiki⁴⁴

The above creation whakapapa are part of a manuscript that was recorded by Hūkiki Te Ahukaramu, a Ngāti Kikopiri – Ngāti Raukawa rangatira and tohunga, whose hapū accompanied his relative, Te Rauparaha on his migration to Muhunua - Otaki (Royal,

⁴⁴ Royal, 2003b, pp. 76-77

2003b). It depicts the Ngāti Kikopiri-Ngāti Raukawa creation narrative. It is their worldview; an oral account that explains the formation of the universe. Rangipōtiki's second partner, Hine-hūpapa, had a number of children of note, including Rehua, Rongo-marae-roa, Tangaroa, and Tūmatauenga. However, Rangipōtiki also co-habited with Papatūānuku, fighting for her hand against his son, Tangaroa. Rangipōtiki prevailed against Tangaroa having many children. One of those children was Tāne, he has many names, as follows:

1. Tāne-mimi-ahi (Tāne who urinates on fires)
2. Tāne-kueo (moist Tāne)
3. Tāne-tūturu (Tāne the 'true' or the post)
4. Tāne-pepeke (limbs of Tāne)
5. Tāne-uatika (Tāne the upright)
6. Tāne-ueha (Tāne the bearer, the support)
7. Tāne-te-waiora (Tāne the living waters)
8. Tānenui-ā-rangi (great Tāne of the heavens)

They all decided that the Sun should be allowed to rise from the armpit of Rangipōtiki. They also decided to separate Rangi and Papa by propping Rangi up so that they could flourish in the world. Mist gathered between the parents. When the moon appeared Papatūānuku became very dark due to the putridness of the 'womb of the sky'. Tāwhiri-mātea was asked to cleanse away the stench. Once this was accomplished, Tānenui-ā-rangi made a decision that the sun would shine during the day, and the moon during the night.

Hūkiki Te Ahukaramu is a descendant of Raukawa and therefore a descendant of Hoturoa, the rangatira who was responsible for the ancestral waka hourua Tainui. His ancestral homeland was located on the western slopes of Maungatautari, known as Rangiātea, near Wharepūhunga-ā-Kahu⁴⁵. His ancestor Tūrongo established a village and a whare wānanga there near the banks of Te Manga-o-rongo River. The following whakapapa is my connection to Hūkiki Te Ahukaramu, my 4th great-grandfather:

⁴⁵ This location was a well-known place for tohunga kōkōrangi, tohunga tātai arorangi to view the stars.

TĒPU 2.2: HE WHAKAPAPA MAI I A TAINUI ME TE ARAWA WAKA KI TE KAITUHI – GENEALOGY FROM TAINUI AND TE AWAWA CANOE TO THE AUTHOR

TAINUI WAKA		TE ARAWA WAKA
Hoturoa		Ngātoro-i-rangi
Hotuope		Tangihia
Hotumatapu		Tangimoana
Mōtai		Kahukura
Ūeroa		Rangitakumu
Rakamaomao		Mawake-nui
Kākati		Mawake-roa
Tāwhao		Mawake Taupō
Tūrongo		Tūwharetoa
Raukawa		Rākeihopukia
Rereahu		Taringa
Te Rongorito		Tūtetawha
Huitao		Te Rangitia
Haetapunui		Parekāwā
Ngātokowaru		Te Kohera
Huia		Pakake Te Taiari I
Kikopiri		
Wahineiti		Te Rangipūmamao
Kaitāwhara	=	Te Tāuhu
TE AHUKARAMU	=	Manumea
Te Roera Hūkiki	=	Rutu
Kiniwe Te Roera	=	Keriata Tukukino
Ataneta Te Roera	=	Kiriwera Tukukino
Tairiri Tukukino	=	Mita Hamaka O’Brien
Raewynne O’Brien	=	Apanui Ngāmoki Skipper

Mātaatua Creation Story

Ngāi Tūhoe are descendants of the Mātaatua waka, and geographically they are an inland iwi, located in rugged terrain in the Urewera region. However, according to the Tūhoe worldview, they say one of their significant ancestors are Te Maunga and Hinepūkohu-rangi, two supernatural beings, who gave birth to Pōtiki I (Best, 1972; Selby, 2010). Every person who affiliates to Ngāi Tūhoe is a descendant of Pōtiki I. Hinepūkohu-rangi also known as Tāiri-a-kohu, was the personification of mist and fog. She had a sister called Hine-wai, who was the personification of light, misty rain. From Pōtiki I, descends the hapū known as Ngā Pōtiki, or more widely known as the Children of the Mist. In Matamua and Temara (2010), Hīrini Melbourne asserts that:

Traditionally, Tūhoe believe they are the direct descendants of their environment. The mountain and the rivers are their ancestors and the forest inhabitants their kin...As a tribal group Tūhoe trace their origins to the ancient union between Te Maunga (the mountain) and Hinepūkohurangi (the mist maiden). This archaic marriage is personified in the mists that settles on the mountainous abode of Tūhoe, which gave rise to the saying, 'ngā tamariki o te kohu' 'children of the mist' (p. 97).

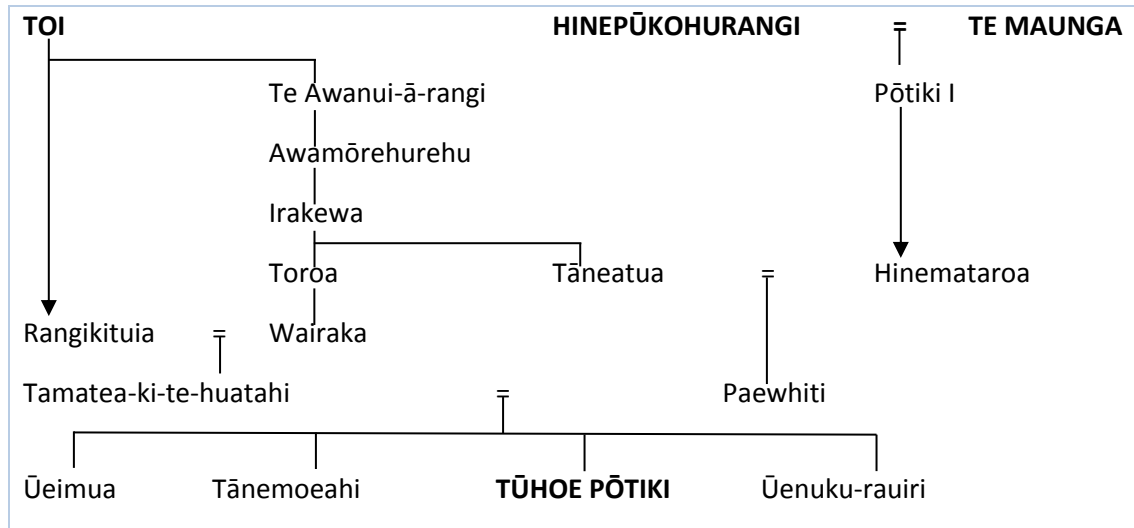
Best's (1972) local sources provide further in-depth explanation of the Ngāi Tūhoe whakapapa and worldview:

In times long past away, when men held strange powers and god-like beings dwelt on earth, there lived one Hinepūkohu-rangi. She was the personification of mist and fog, while her young sister, Hine-wai, was the personification of the light, misty rain, which descends to earth in foggy weather. One Tāiri-a-kohu, a personification of the mist, is said to be the same as Hinepūkohu-rangi. The former is the name by which she is known to the Ngāti Kahungunu people of Te Wairoa, who say that she descended from the sky and abode with one Ūenuku, who later became a rainbow god. Hinepūkohurangi is said to have lured Te Maunga (the mountain) to earth at a place called Onini, which is on the line of road from Galatea to Waikaremoana, at Ruatahuna, on the left bank of the Mana-o-rongo stream, and opposite Te Kau-tāwhero and Māna-tēpā. A clump of flax marked the spot where Te Maunga came to earth. From the union of the Mountain and the Mist Maiden sprang Pōtiki the First, who appears to have been an ordinary specimen of human being, and from whom descended the tribe known as Ngā Pōtiki (p.23).

The following whakapapa shows the descent lines from Te Maunga and Hinepūkohurangi known as the Mist Maiden, including the grandparents of Tūhoe, Tāneatua and Hinemataroa. Hinepūkohurangi descended from Rangiroa (Lofty Heavens) and Rangimamao (Distant Sky). She enticed Ūenuku to descend from the heavens to earth where he became Te Maunga or the Mountain. Tāneatua was a well-known tohunga and the brother of Toroa, the captain of the Mātaatua waka.

This is why, as Hīrini Melbourne said, Ngāi Tūhoe were known as the ‘Children of the Mist’ or Ngā Tamariki o Te Kohu.

TEPŪ 2.3: HE WHAKAPAPA MAI I A HINEPŪKOHURANGI RĀUA KO TE MAUNGA KI A TŪHOE PŌTIKI – GENEALOGY FROM HINEPŪKOHURANGI AND TE MAUNGA TO TŪHOE PŌTIKI



TE WEHEWEHENG A RANGINUI RĀUA KO PAPATŪĀNUKU – SEPARATION OF RANGINUI AND PAPATŪĀNUKU

“Whiti ora ki te whei ao ki Te Ao Marama – Tīhei mauri ora!”⁴⁶

Of central importance to the Māori creation narrative is the separation of Ranginui and Papatūānuku, which marked the transition between Te Pō and Te Ao Mārama. It not only created space but also introduced light, necessary for the development of their offspring and the natural world. Light in this context refers to the natural phenomenon, as well as the metaphorical sense of enlightenment or growing understanding of how things develop (Royal, 2008, pp. 83-86, 123-124; Best, 1976, p. 69).

The traditional narrative describes how confined the sons of Rangi and Papa, were between the suffocating embrace of their parents. It also explains how Uepoto had shown his brothers, a faint, vague light in the darkness known as ‘Hinātore’. This “glowing light” that they had all seen, lured them to seek out its origin (Best, 1941, p. 95; 1976, pp. 80-81). This in turn led to the first known wānanga between Rangi and Papa’s children to discuss how they could improve their cramped, living conditions.

⁴⁶ Cross over from twilight to daylight – let there be life!

The separation of Rangi and Papa was the result of this hui. The main participants were: Tāne, Tūmataenga, Tāwhiri-mātea, Tangaroa, Rongomātāne, Whiro and Haumia-tiketike. Tūmataenga demanded that they kill their parents so that they could live and flourish. Tāne, however, did not agree to murder, but suggested they separate them instead. They deliberated carefully with the majority agreeing with Tāne's suggestion.

However, Tāwhiri-mātea and Whiro vehemently refused to support Tū's or Tāne's proposal to kill or separate their parents. They tried in vain to convince them that life would be better without their parents. Their parents protected them from the cruel, freezing cold winds from outside.

When a consensus of opinion was reached in Tāne's favour, Whiro remained silent, but Tāwhiri-mātea went into a violent rage as he watched as his tuākana or tēina tried to separate their parents. Tāwhiri-mātea warned them what he would do to them if they persisted with this "idiotic" act (Winitana, 2014; Best 1976, pp. 83-87).

In *The Lore of the Whare Wānanga – Te Kauwae Runga*, Tāne is the principle character: "Let us now separate our parents that Rangi and Papa may occupy different places" (Smith, 2011, p. 121). When Tāne asks for a consensus of opinion from his brothers whether they should separate their parents, Whiro is the only one who disagrees. However, after deliberating amongst themselves, Tangaroa, Tāwhiri-mātea, and Tūmataenga finally agree.

After all his brothers had tried and failed in their attempts, Tāne repositioned himself on his back to his mother Papatūānuku with his face upwards. He braced his powerful legs against his father Ranginui and began to push.

Tāwhiri-mātea looked on in anguish and disbelief as Tāne successfully pushed his father high into the heavens above. The darkness disappeared into a greyish tinge, as the screams of Rangi and Papa being rent asunder reverberated throughout the heavens. Then clear for all to see was the blood of both Rangi and Papa smeared across the first

dawn as brilliant, blinding, white light streamed in and for the first time ever, they all felt the chill, foreboding winds (Winitana, 2014, pp.49-50).

Tāwhiri-mātea, the god of winds and tempest, vowed eternal revenge on all his brothers for separating their parents. This is why whenever thunder boomed, lightning flashed, and violent storms, and howling gales roared causing widespread destruction, our ancestors reflected about the utu of Tāwhiri-mātea:

“Nā te aroha kē i kore ai au i whakaae ki te wehe i ōku mātua. Āna! Kua arohea rāua, he rāwakiwaki nā te mamae roa. Kei runga a Rangi e kōkōtongatia ana, kei raro nā a Papatūānuku e kunāwhea ana i te anu mātao. Ūpokokohua! Ka titipia aku tāina! Tipihaurarotia! E kore rawa au e mutu kia orotātia rā anō rātau”⁴⁷

“I didn’t agree our parents be seperated because of my love for them. Now look! They’re in pain and endless grief. Rangi stands about in abject misery, Papa lies below stricken with cold. Imbeciles! I will exterminate my brothers. Destroy them! I will not relent until every last one of them has been utterly consumed!” (Winitana, 2014, p. 13)

Their sons’ initial emotion was ecstatic joy from being bathed in sunshine for the first time. The vacuum was filled with a deafening silence and then with a growing, roaring cry the intense cold filled the void.

Tāwhiri-mātea watched in abject horror as his father and mother screamed while they were ripped apart. Rangi begged Tāne to return him to Papa’s embrace, but Tāne refused saying to him that the world would be plunged back into darkness. Rangi’s tears fell as rain drops upon his wife for the first time, mourning his lost love. Papatūānuku’s own tears rose up into the heavens to her lover as mists. This monumental event was the first time that Tāne and his tuākana and tēina experienced being lashed by rain and wind.

In Best (1976), Kohaonui and Kohaoroa were responsible for chopping down the pou that supported Rangi-nui. Paia provided them with the two tapu toki known as Te Awhiorangi and Whironui to cut down ‘Whānau-puhi’, the wind children⁴⁸ also known as the pou that were located under Rangi-nui’s head, legs, left and right arms (p.84). As Rangi-nui was thrust up into the heavens, he grabbed hold of Papa. Tāne called upon his

⁴⁷ Winitana, 2014, p. 13[Māori]; p. 51[Pākehā]

⁴⁸ Toro-huru-nuku, Toko-huru-rangi, Toko-huru-mawake, and Toko-huru-ātea

brothers, Tū-matauenga, Tū-mata-kakā and Te Akaaka-matua to cut off the arms of their parents.

After this action, a red glow was also seen in the heavens, like the Winitana account, known as a papakura. From this time onwards, *tohu*⁴⁹ were sought at dawn or dusk by people, to ascertain what type of weather was to be expected. Best (2005) states that after separating his parents, Tāne sweated profusely:

Ka titiro a Rangi ki a Papa e tiraha ake ana te aroaro ka puta te aroha o Rangi, ka tangi ia, koia te ua e ua nei. He werawera nō Tāne i te wehenga i tōna pāpā me tōna kōkā te kohu me te hautō rua e kite nei tātau (p.282).

As Rangi stared at Papa exposed below, Rangi's affection poured out, he mourned, hence the rain that rains. The sweat is from Tāne from separating his father and mother the mist and dew that we now see.

According to the Ngāi Tūhoe version, after the separation of Rangi and Papa, the world remained in darkness. Dr Rangi Matamua shares the Ngāi Tūhoe version at a Kura Reo held on a Heretaunga Marae in 2011:

Even though Wainui slept with Tangotango and had Te Rā (Sun), then Marama (Moon) and then the myriad stars in the sky, followed by Hinātore (Phosphorus Light, a faint light with a glow), these were known as Te Whānau Marama (The Children of Light). But still there wasn't enough light produced to make a real difference. So Tāne approached his siblings to give him Te Whānau Marama to place on the bosom of Ranginui. At first, Wainui and Tangotango would not agree but Tāne being Tāne persuaded them to agree. Three baskets were created. The first one held Te Rā, the second held Te Marama and the last kete held the Stars, it was known as Te Kupenganui. Then Tāne sought out his relative Tamarereti. He said to Tamarereti, "E hoa, he mahi nui kei mua i a tāua i tēnei wā, kei a koe tētahi waka? – Friend, we have a huge task ahead of us now, do you have a canoe?" According to Ngāi Tūhoe, the name of this sacred waka was Puna-ariki. Tāne explained to Tamarereti they needed to travel up into the heavens to affix Te Whānau Marama across the breast of Ranginui. Tāne grabbed hinātore first and placed it into the heavens, however, it made no difference. Then he gathered the stars and placed them into neat looking patterns across the night sky such as Tautoru, Rehua, Mahutonga and Whānui. Tāne was so happy with his masterpiece he decided to do a haka on the spot. He got so excited he started to kick out with his feet accidentally booting the kete into space scattering the stars willy-nilly all over the place. Hence, the reason why most of the stars do not look like any design at all. Next, Tāne took hold of the moon, and for one part there, things looked optimistic but then it grew dark again. Tāne took hold of the last kete that held Te Rā, and affixed it to his parent. Then lo and behold glorious light was introduced for the first time into the world – Te Ao Mārama. This was known by Ngāi Tūhoe as 'Te Ōrokohimatanga o te rangi, o te whenua, o te rā me te whānau marama (R. Matamua, personal communication, 18 February 2011).

⁴⁹ Signs, physical or spiritual signs; environmental indicators

This explains the importance of this pūrākau. The intensity of the separation of Ranginui and Papatūānuku was such that it created the universe, the sun, the moon and the stars. It also provided a huge amount of space for Tāwhiri-mātea to rage against his brothers. This event also symbolises the separation of male and female principles - giving space to each. It not only created space but also introduced light and the sensation of cold, necessary for the development of Rangi and Papa's offspring and the natural world. Light in this context refers to the natural phenomenon, as well as the metaphorical sense of enlightenment or growing understanding of how things are.

The intense cold winds that the offspring of Rangi and Papa felt rush in to fill the void created by the separation of their parents was a new sensation, a new feeling that accompanies those who are prepared to take up the challenge and be independent⁵⁰.

Ironically, the forced separation of the parents created splits within the tamariki too. It created two factions. On the one hand, Tāne and those who supported him, and on the other Tāwhiri-mātea, and Whiro. Younger siblings like Tāne excelled, where others who were tuākana, failed, believing that their status as an elder brother, like Whiro, gave them the right to lead.

Tāwhiri-mātea sought revenge not just against Tāne, but all his brothers. Lines were being drawn in the sand. Jealousy and embarrassment continued to fuel the building anger and rage within Tāwhiri-mātea and Whiro. The deep clarion call of the pūkaea to arms, resounded throughout the heavens. Conflict was inevitable.

KO TE WHĀNAU PUHI A TĀWHIRI-MĀTEA – THE TREASURED FAMILY OF TĀWHIRI-MĀTEA

Utter disbelief turned into homicidal rage as Tāwhiri-mātea witnessed the unceremonious separation of his parents for all eternity. His words of warning had gone unheeded and for that act he demanded revenge (Winitana, 2014, p.51).

⁵⁰ Royal (1998) proposes that the carved ancestral wharenui (meeting house) is perhaps the best-known symbol of the emergence of light - Te Ao Mārama (the world of light). The roof symbolises Ranginui, the floor Papatūānuku, and the pillars, upholding the roof, represent the posts used by Tāne to lift his father, thus separating his parents. Above the doorway is a carving of Hinenui-te-pō - the Māori goddess who guards the passage between life and death. The poutūārongo, or the rear wall of the whare represents Te Kore, thus making the doorway the symbolical transition from Te Pō to Te Ao Mārama, from darkness to light (pp. 59-60).

Tāwhiri-mātea fled to his fathers side to plot revenge. Feeling slightly outnumbered, Tāwhiri-mātea produced as many offspring as possible. It was during this time that he produced a family of winds, a family of clouds, a family of rain, a family of thunder and lightning at the third heaven known as Rangi-naonao-ariki (Smith, 2013, p. 126). Anderson (1969) describes what happened after Rangi and Papa were seperated:

And as great Rangi' listened to the suggestions of Tāwhiri-mātea thoughts and plans were formed in his breast, and Tāwhiri-mātea also understood the things he should do. Then by himself and by Rangi' were begotten a numerous brood, and they rapidly increased and grew. Tāwhiri' dispatched one of them to the west, one to the south, one to the east, and one to the north; and he gave corresponding names to himself and to his progeny, the mighty winds (p.369).

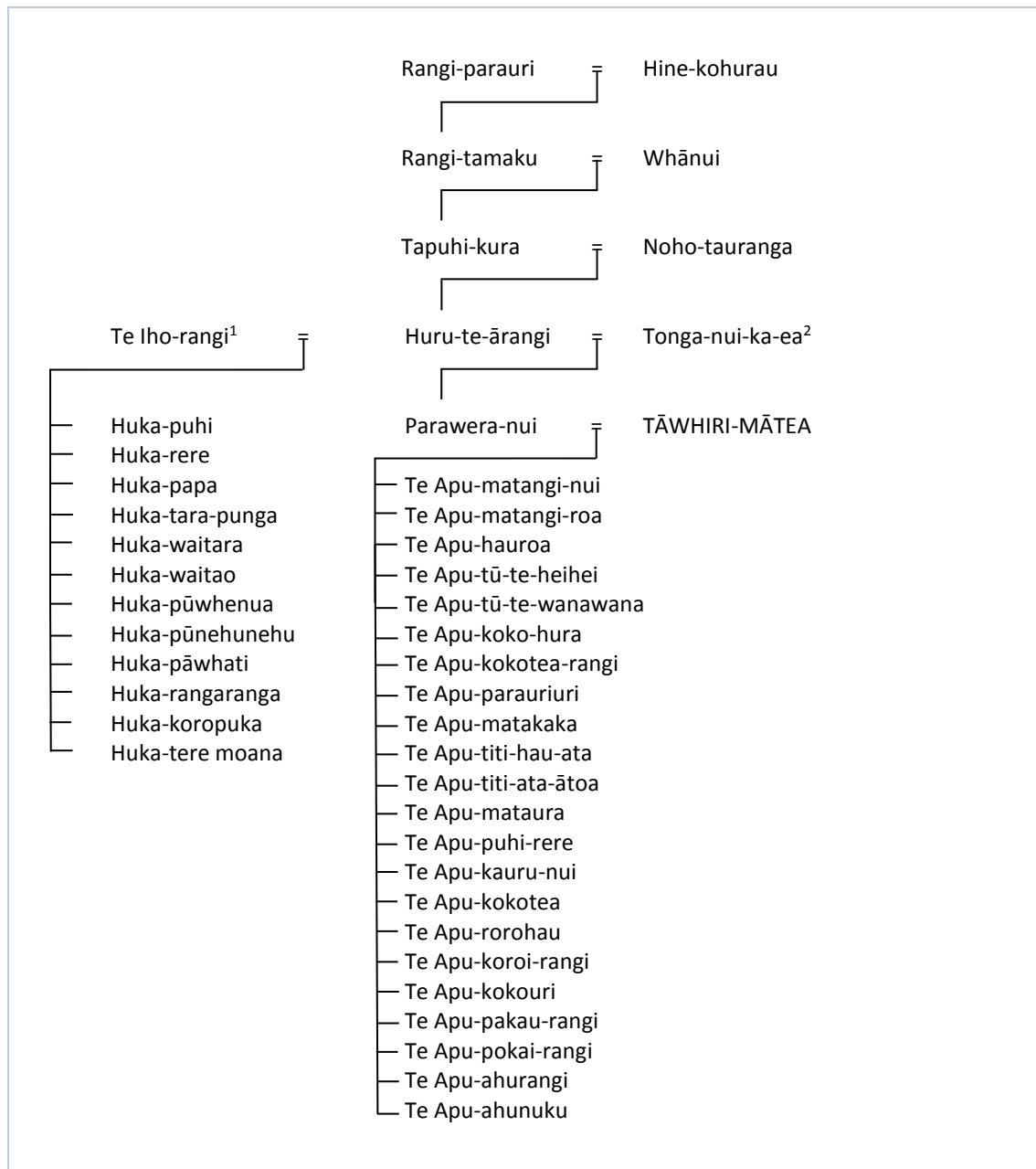
Anderson continues his explanation, specifically naming different types of winds and cloud forms:

He next sent forth of his children Apuhau, and Apu-matangi, and Ao-nui, and Ao-roa, and Ao-pouri, and Ao-pōtango, and Ao-whetuma, and Ao-whekere, and Ao-kahiwahiwa, Ao-kānapanapa, and Ao-pakakina, and Ao-pakarea, and Ao-takawe – that is, Fierce Squalls, Whirlwinds, Dense Clouds, Massy Clouds, Dark Clouds, Gloomy Thick Clouds, Fiery Clouds, Clouds which precede Hurricanes, Clouds of Fiery Black, Clouds reflecting Glowing Red Light, Clouds wildy drifting from all Quarters and wildy bursting, Clouds of Thunderstorms, and Clouds hurriedly flying; and in the midst of these Tāwhiri-mātea himself swept wildy on (p.369).

A number of rain types were then created as a result of the forthcoming conflict initiated by Tāwhiri-mātea. According to Smith (2011), Tāwhiri-mātea, Tūkapua, Te Ihorangi, and Tāwhirirangi were assigned Tāuru-rangi, the seventh heaven from the summit to reside (p.152).

It was during that time, 23 tamariki of Tāwhiri-mātea and Parawera-nui were created. It was these tamariki that transported Tāne-nui-ā-rangi by way of Te Ara-tiatia to reach Te Toi-o-ngā-rangi (p.155). They were known as Te Whānau Puhi o Tāwhiri-mātea.

TĒPU 2.4: HE WHAKAPAPA MŌ TE WHĀNAU PUHI O TĀWHIRI-MĀTEA – GENEALOGY ABOUT THE TREASURED FAMILY OF TĀWHIRI-MĀTEA



Like Tāwhiri-mātea, Huru-te-ārangi was another progenitor of winds. Huru-te-ārangi's first husband was Te Ihorangi⁵¹. Their offspring were all the various types of snow, dwelling on the summits of Mahutonga⁵². Whenever the fierce south winds blew, these tamariki of Huru-te-ārangi and Te Ihorangi would accompany their whanaunga (p.155). Huru-te-ārangi's second husband was Tonga-nui-ka-ea. They had Parawera-nui⁵³ who

⁵¹ Male personification of rain.

⁵² Southern Cross

⁵³ Fierce south wind, wife of Tāwhirimātea

married Tāwhiri-mātea. Further to this, Smith (2011, p. 131) includes other names of Tāwhiri-mātea and Parawera-nui's children⁵⁴. They are:

1. Titi-ā-toa
2. Titi-atamai
3. Titi-matangi-nui
4. Titi-mata-ura
5. Titi-parauri
6. Titi-puhi-kura
7. Titi-mata-kura
8. Titi-kāuru-nui
9. Titi-roro-hau
10. Titi-te-apu-hau
11. Titi-te-apu-nui
12. Titi-te-apu-parauri

All Paraweranui's and Tāwhiri-mātea's tamariki were types of whirlwinds, who assisted Tāne's ascent and descent to and from Te Toi-o-ngā-rangi in order to acquire the three baskets of knowledge.

Keane (2010, pp. 34-37) noted numerous personifications of the weather such as winds, storms, thunder, lightning, snow, hail, frost, mists, and rainbows. Best (1972, pp. 849-903) also includes other weather phenomena, here some examples:

1. Imurangi⁵⁵ (horizontal rainbow, reddish glow lying on the earth)
2. Umurangi (red appearance in the sky, of a round form seen during daylight)
3. Heuheurangi (a form of mist, child of Hine-pukohurangi and Uenuku)
4. Tūpai (personified form of lightning)
5. Te Potiki-a-Rakamaomao (South wind)

⁵⁴ Titi-parauri (the black whirlwind); Titi-mata-kake (the ascending whirlwind); Titi-matangi-nui (the great windy whirlwind); Titi-arū-rangi (the whirlwind ascending to heaven) are other whirlwinds that are tamariki of Tāwhiri-mātea and Parawera-nui

⁵⁵ Imurangi married Tuhirangi and their descendants are rainbows

NGĀ KETE O TE WĀNANGA – THE BASKETS OF KNOWLEDGE

Tāwhiri-mātea and his progeny play a key role in the acquisition of Ngā Kete o te Wānanga. There are two main narratives. The popular version involves Tāne, who was chosen by Io's messengers, Ruatau and Rehua, as the most worthy to ascend the heavens in order to obtain the three baskets of knowledge for the benefit of all mankind (Smith, 2011, pp. 124-125). However, the Tainui, Te Arawa and Ngāti Awa tribal confederations acknowledge Tāwhaki⁵⁶ and not Tāne, who succeeded in acquiring the baskets of knowledge from Io. Whiro opposed the selection of Tāne on the grounds that Tāne was a teina or junior to him. Regardless of Whiro's position, Tāne remained steadfast, ascending the heavens with the help of Tāwhiri-mātea's children⁵⁷, who bore him and others, by way of Aratitia and Te Toihuarewa. Smith also names four whirlwinds, who also conveyed Tāne to Te Toi-o-ngā-rangi (Smith, 2011, p. 128):

1. Titi-parauri (black whirlwind)
2. Titi-mata-kake (ascending whirlwind)
3. Titi-matangi-nui (great windy whirlwind)
4. Titi-arū-rangi

Whiro, blind with jealousy, took another pathway⁵⁸ intercepting Tāne at the eleventh heaven, commanding his forces, Te Āitanga-a-Pepeke⁵⁹ and Te Tini-o-Poto to attack Tāne (Buck, 1950, pp. 128-129). Tāne sought Tāwhiri-mātea's assistance, causing fierce gales – Te Tini-o-Parauri, to counter their attack (Smith, 2011, p. 126)⁶⁰. Tāne succeeded in passing through the Te Pūmotomoto entrance at the twelfth heaven at Te Toi-o-ngā-rangi, and after numerous purification rites gained access into Matangireia where Io dwelt. After asking Tāne for the purpose of his visit, which was to obtain the 'wānanga', Io took him to Rangīātea, where the whatukura guardians presented Tāne with three

⁵⁶ Also known as Tāne-tapu interesting enough (Jones, 2013, p. 199)

⁵⁷ See 'Ko Te Whānau Puhī a Tāwhirimātea', page

⁵⁸ Whiro ascended by Te Taepatanga-o-te-rangi

⁵⁹ Hordes of namu poto (small sandflies, Naonao (midges, rō (stick insects), peketua (centipedes), pepe-te-nuinui (butterflies), pepe-haratua (hopping insects), manu (birds) and pekapeka (bats)

⁶⁰ This is a Tai-rāwhiti creation narrative, hence in this version Tāwhiri-mātea grudgingly agrees to the separation of their parents, and when asked by Tāne for assistance to ascend Te Toi-huarewa ki te Tihi-o-Manono to bring the three kete back for the benefit of mankind, Tāwhiri-mātea agreed

baskets of knowledge and two sacred stones⁶¹. The three kete were known as (Smith, 2011, p. 130):

- | | | |
|--|---|-----------------------------|
| 1. Te Kete Uruuru Matua/Te Kete Tuauri | - | Spiritual knowledge |
| 2. Te Kete Uruuru Rangi/Te Kete Tuatea | - | Ritual knowledge |
| 3. Te Kete Uruuru Tau/Te Kete Aronui | - | Beneficial, known knowledge |

Marsden (2003a), explains Ngā Kete o te Wānanga as three different worlds or dimensions:

What is the meaning of these baskets? There are three baskets: the first is Te Kete Tuauri and concerns the world of Te Tuauri ('beyond in the dark'). These are worlds. Te Kete Aronui concerns the world that we reside in, Te Ao-tū-roa ('the long standing world'). Te Ao Tua-ātea is referred to as Te Ao-mutunga-kore, the eternal world...(p.79).

These set of esoteric instructions allowed mankind the opportunity to understand the kauwae-runga (celestial knowledge) and kauwae-raro (terrestrial knowledge). These traditional narratives demonstrate that the acquisition of knowledge is not for everyone, that it is often a lonely journey if not supported by your whānau, and it often incites jealousy, resentment and envy, including perceptions of elitism by the uninitiated. Jones (2013a) states that:

Tāwhaki, having returned to earth with the Sacred Baskets of Knowledge, found that events befell as predicted by Rehua. There was much jealousy among mankind, and warfare again arose. And so down through the ages the peoples of the world have shown resentment toward any man becoming possessed of the treasures of the Sacred Baskets of Knowledge, or the Knowledge of the Important Things of the World (pp.85-86).

Sacred, esoteric knowledge was only for those who not only had the mental faculties to retain the knowledge, they had to be invited to learn. None of the teachings were allowed to be shared with the uninitiated (p.87).

Tohunga practitioner, Pouroto Ngāroto (Ngāti Awa, Ngāti Tūwharetoa), differs from most other iwi. He states that Ngāti Awa and Ngāti Tūwharetoa talk about the

⁶¹ Named Huka-a-tai (sea foam – a white, opaque stone) and Rehutai (sea spray – a reddish stone)

acquisition of four kete, not three, and that Tāwhaki, not Tāne, obtained the Kete wānanga from the gods.⁶²

Ko te mauri tuku iho, mai rā anō, i roto i ngā kete wānanga. Kei ia iwi anō ana kōrero. Ki tā Te Mātorohanga e toru ngā kete. Ki tā Ngāpuhi e toru ngā kete. Ki ā tāua, a Mātaatua, a Tūwharetoa i roto o Ngāti Awa e whā kē ngā kete... Te pikitanga ake, nā wai i tiki atu, nā Tāwhaki. I ahu mai tērā mauri i hea te mātauranga i kōrerohia ake nei? I ahu mai i ngā atua. Mai Io, Ionui, Iroa te aha ake, te aha ake...taka iho te mauri ki te pū, te more, te weu, te aka, te rea, te wao nui, te kune, te whē, te kore, te pō. Taka iho ki a Rangi rāua ko Papa, heke iho ki a Māui. Nā Māui ka puta ki waho ko Whaitiri. Ka moe a Kaitangata, ka puta ki waho ko Hema, nāna ko Tāwhaki. Nō reira ānei rā te mauri e kōrerohia ake nei (Ngārope, 2015).

The mauri handed down for generations from the kits of knowledge. Each tribe has their own story. Te Mātorohanga stated that there were three kits. Ngāpuhi held there were three kits. Amongst us, Mātaatua, Tūwharetoa within Ngāti Awa there were four kits...Who made the climb, Tāwhaki. Where did the mauri of knowledge come from I'm talking about? It came from the gods. From the gods down to Māui. Māui had Whaitiri. Whaitiri took Kaitangata as her husband and had Hema. Who had Tāwhaki? That is the mauri I'm talking about.

Tāne descended the heavens and at the fourth heaven he was again attacked by Whiro's war party, but Tāwhiri-mātea and his whānau puhi defeated them yet again. Once he reached the lowest heaven the sky flashed a brilliant red, signalling that Tāne had been successful. The baskets of knowledge and the two sacred stones were deposited on the pou-tuarongo in Wharekura the first known whare wānanga (Buck, 1974, p. 449).

The key lessons are:

- The pathway to acquiring knowledge is not easy
- The individual selected undergoes rigorous assessment
- Knowledge is not something that is gifted to everyone
- Specific instruction occurs in specific places
- Those that obtain knowledge are often viewed with jealousy and envy

These sacred baskets of knowledge formed the basis of what was understood about the Māori universe, the Māori worldview. Traditional learning institutions were established to retain, disseminate, to create, and innovate new esoterical lore. In Ūpoko Tuawhā further discussion will focus on the establishment of whare wānanga in Aotearoa.

⁶² Paepae: Series 1 – Episode 14: <http://www.maoritelevison.com/tv/shows/paepae/S01E014/paepae-series-1-episode-14>

NGĀ POUTIRIAO – THE SPIRITUAL GUARDIANS

*Tau āionuku, tau āiorangi
Tau ioio rangi, tau ioio whenua
Ko ngā pou o te ao ka tiritiria
Ki te whenua, ki te rangi
Ki te pupuri i te tai o te ao
I te tai o te pō
Kia tau ana e!
(Winitana, 2014, p. 29)*

After the traumatic conflict between the tamariki of Rangi and Papa, Io wanted peace and stability (Best, 1976, pp. 106-109; Buck, 1974, p. 447; Winitana, 2014, pp. 29-30 [Māori] / 67-68 [Pākehā]). He instructed Tāne and Rehua to appoint the Poutiriao or the spiritual guardians to regulate, maintain balance and order throughout the universe. According to Robinson (2005) the destruction created during Te Paerangi had gone on long enough, what was needed was divine intervention:

This was the sound of the mighty as the Supreme Voice roared above. There came the mighty, and the universe in its reverence before the magnificent fell into order. The gods stopped fighting, and by the Supreme Being Io-io-whenua peace was brought to the firmament. All the atua were appointed over the elements. All of them were assigned different tasks. The atua, the many of them, the sons of Rangi and Papa and all the atua born from Te Pō, now stand back to back, around a great circle surrounding the earth; keeping order over the elements they wished to have. There they partake and control the forces under them in the natural cycle of the world (p.33).

Robinson's Ngāi Tahu account describes how Io brought about peace after witnessing the cataclysmic battle of the gods and the devastating impacts it had on everyone.

Smith (2011) states that Tāne-te-waiora, Ruatau, Pawa and the Whatukura were responsible for appointing the Poutiriao. Tama-te-ūira⁶³, and Tū-mata-kakā were appointed by them, with the responsibility of moderating the destructive force of their lightning whānau, which explains why lightning storms are usually only of a short duration (p.154). The Lightning whānau are as follows:

1. Hine-whaitiri-papa
2. Hine-muri-ahi
3. Te Hiko-tara-pae
4. Te Hiko-puawhe

⁶³ Tama-te-ūira and Tū-mata-kakā are both personifications of lightning

5. Te Hiko-tara-wanawana
6. Te Hiko-pou-tiri-ao
7. Te Hiko-ahoaho
8. Te Hiko-puahō
9. Te Hiko-waineha
10. Te Hiko-tarewa

Best (1976) includes Tūkapua and Te Ihorangi with Tama-te-ūira as the poutiriao appointed to control the movements of the winds, snow, rain, clouds, mists, lightning and thunder to minimise any contention amongst them from causing harm amongst themselves and to mankind (pp.107-108).

Ko ngā poutiriao koia nei rātau i purea ai hei tātai i te haere a ngā hau, a ngā huka, a ngā ua, a ngā kapua, a ngā kohu, a ngā ūira, a ngā whaitiri koi taupatupatu nei ki a rātau, koi tahuri rātau ki ā Papa hanga kino ai i te aotūroa: Ko Tūkapua, ko Te Ihorangi, ko Tama-te-ūira, ka mutu rātau i tēnei kauwhanga o Rangi-nui, o Papatūānuku, e tauhere ana i te ahurangi o taua kauwhanga (pp.401-402).

The Poutiriao had the authority to intervene and to correct any divergence from the binding peace of Io.

TE PAERANGI – THE WAR OF THE GODS

Professor Ranginui Walker states that due to the abhorrent act separating their parents, Tāwhiri-mātea felt that the only way this wrong-doing could be rectified was to seek utu or revenge, a most significant value that all Māori tūpuna knew and understood (Walker, 1992, p. 171). Seeing and feeling the absolute despair of his parents, Tāwhiri-mātea sought out the female goddesses of the heavens to produce as many offspring as possible. These were violent winds, tornados, hurricanes, cyclones, sleet, ice, snow, hail, biting rain, thunder, and lightning to attack his siblings. He demanded revenge from his brothers part in the transgression against his parents by attacking their creative efforts with his destructive offspring (Walker, 1992, p. 171).

In the war of the gods that followed the separation, Tāwhiri-mātea, the god of the winds, who opposed it, devastated the forests of Tāne with winds of hurricane force. Having vanquished Tāne, he lashed up mountainous seas over the dominion of Tangaroa, driving the descendants of that deity to seek shelter from his wrath. The scattering of the children of Tangaroa brought about the separation of the species, with Ikatere fleeing to the depths of the ocean to become a progenitor of fishes, and

Tū-te-wehiwehi going inland to establish the reptilian family. Tāwhiri-mātea was unable to vent his wrath on Rongomātāne and Haumiatiketike because their mother Papatūānuku hid them from him by thrusting them deep into her bosom. Being untested in the crucible of war, these descendants were cast in passive roles. Haumiatiketike became the deity associated with edible fern roots and other wild and uncultivated plants. Rongomātāne became the custodian of the kūmara and god of cultivation and peaceful arts (Walker, 1990, p.13).

First, he targeted Tāne, by decimating his forests so they became food for insects, allowing them to rot and to decay. Then he attacked Tangaroa, who hid in the deepest part of the ocean as Tāwhiri-mātea raged above. He then sought out Rongomātāne and Haumia-tiketike who fled to their mother Papatūānuku for protection. These two gods dependence on their mother relegated them to a lowly state. Rongo became the God of the Kūmara, and cultivated foods, and Haumia, God of the fernroot and uncultivated foods. Lastly, Tāwhiri-mātea faced Tūmatauenga. Tūmatauenga was the only one who stood up to Tāwhiri-mātea's blind wrath. No matter what he used to attack his brother, Tū persevered and eventually overcame him (Grey 1971, pp. 7-10; Buck 1974, pp. 440-441; Walker, 1992, pp. 171-172).

Walker (1992) states that these series of attacks became known as the first act of revenge. It also reinforced to Māori society that in most circumstances forcible separation or the killing of one's parents was not only abhorrent, but an immoral act. Walker manages to capture the true essence of how kōrero pūrākau were used as a model of disseminating and instilling our creation stories, philosophies and values - our worldview, in a way that allowed rangatahi to better understand quite deep and spiritual narratives. He argues that:

*Properly understood Māori mythology and traditions provide **myth-messages** to which the Māori people can and will respond today. All that is needed is that these myth-messages be more clearly signposted (Walker, 1992, p. 170).*

According to Tunks (1997) changes in the weather and climate were the result of an ongoing disagreement among the principal offspring over the separation of Ranginui and Papatūānuku:

Tāwhiri-mātea, enraged by the cruelty against their parents, continues to support Ranginui by attacking his brothers that remain upon Papatuanuku. His initial attack after the separation of Rangi and Papa produced further offspring in the form of dark, billowing rain clouds, heavy rain, hurricanes and typhoons, lightning, hailstones, thunder and large waves. The conflict between Tāwhiri-mātea and Tāne and

Tūmatauenga continues to this day, reflecting an uneasy relationship between those that dwell upon the earth and the climatic elements (Tunks, 1997, p. 74).

Matamua (2011) explains the Ngāi Tūhoe version of how Tāwhiri-mātea sought utu. It was a narrative that was shared by Kimoro Pukepuke, an elder of Ngāi Tūhoe and Whakatōhea to Matamua. In their version, Tāwhiri-mātea objected to the separation. He launched a systematic attack on his siblings. First, he attacked Tāne, then Tangaroa, then he pursued Rongo-mā-tāne and Haumia-tiketike. Last, he left all his anger for Tūmatauenga, the one who suggested they should kill their parents:

Ahakoā te nui o te hau, te kino o te hau me te ua, ka tū māro nei a Tūmataūena, ā, ka toa ia. Ka hopo pea a Tāwhiri-mātea. Ka tikaro i ōna karu, ka kōtētē ki te rina, ka penupenuhia, ka whiu ki runa hei tohu aroha ki te pāpā. Koirā e kīa nei ko Mata-Ariki, ko nā mata o te ariki ko Tāwhiri-mātea tēnei (R. Matamua, personal communication, 18 February 2011).

Despite the strong gales, fierce winds and rain, Tūmatauenga stood fast against the onslaught, winning the battle. In fear that Tāwhiri-mātea might lose, he plucked out his eyes, crushed them in his hands and hurled them to the heavens as a token of his love for his sire. Hence the name Mata-ariki, the eyes of the god Tāwhiri-mātea.

Kimoro continues his kōrero, explaining the unpredictability of the wind by the fact that the god of the winds and the tempest, Tāwhiri-mātea, was a blind god, a sightless god. He had to feel his way around, as his eyes were affixed on the bosom of Ranginui above. However, Tāwhiri-mātea is forever out for revenge, *kia tūpato, kei mau here i a koe!* So be careful lest he catches you! This Tūhoe narrative also describes the eternal conflict mankind has with the weather, its erratic nature and its unerring ability to maim or kill the unwary.

According to Samuel Timoti Robinson (2005) from Ngāi Tahu, Ruaimoko⁶⁴ like his tuakana Tāwhiri-mātea was enraged that his tuākana had separated their parents. In his fury, he stamped his feet creating earthquakes, renting the earth asunder. Volcanic ash clouds exploded, spewing boulders and molten lava high into the air. Ruaimoko's voice boomed across the heavens as lightning cracked and split the heavens above. This atua is forever linked to his tuakana, Tāwhiri-mātea, both are held responsible for the impacts of extreme weather events on vulnerable Māori communities.

⁶⁴ The last born child of Rangi and Papa, god of earthquakes and volcanic activity

In *'The Lore of the Whare Wānanga – Te Kauwae-Runga'* (Smith, 2011, p. 134), the main antagonist is not Tāwhiri-mātea but Whiro, who is instrumental in organising conflict after conflict against Tāne⁶⁵, due to the fact that he, and not Tāne, should have been given the right to acquire the three kete of knowledge from Io, and the two sacred stones, Te Hukatai and Rehutai⁶⁶ because he was Tāne's tuakana. The narrative explains further the reasons why Whiro persisted in his singular quest to destroy Tāne. His hatred and blind jealousy for Tāne grew until it became permanent. The reasons for this jealousy are as follows (Smith, 2011, p. 124):

1. Tāne and some of his brothers advocating that their parents should be separated.
2. Tāne persuading his brothers to leave the warm embrace of Rangi and Papa.
3. The biting cold of anu-rangi, anu-wai, anu-winiwini, and anu-mātao.
4. The cutting off of the arms of their parents using the toki, Te Awhiorangi and Te Whironui.
5. Tāne assuming a senior leadership role without prior consent of his tuākana. Whiro would have consented if one of his tuākana assumed the responsibility of acquiring the three baskets of knowledge and the two sacred stones.
6. The pathway that Tāne decided to take – ki te toi-o-ngā-rangi; Whiro should have been asked to accomplish such an important task not a junior brother like Tāne.

The reasons articulated by Whiro clearly demonstrate that very special tasks needed a measured approach involving careful consideration, and the sanction of all the whānau before beginning. It also explains the importance and place of tuakana and teina within the Māori worldview. However, it shows that younger members of the whānau, like Tāne, are quite capable of completing seemingly impossible tasks. Hence, he becomes the model for humankind to emulate.

After Tūmataunga had fought Tāwhiri-mātea to a stand still, he took his revenge on his tuākana and teina who refused to support him against his battle with Tāwhiri-mātea. Once he had completed his conquest of all his brothers, he composed specific karakia for each of them to ensure that their offspring were a plentiful food resource for him. Eventhough Tūmataunga could not completely defeat Tāwhiri-mātea, he managed to

⁶⁵ In total 21 battles were fought against Tāne (Smith, 2011, p. 134)

⁶⁶ These celestial stones represented the mana and the esoteric knowledge of its teachings (Best, 1976)

get Tāwhiri-mātea to assign a karakia to him to provide favourable winds and fine weather in order to harvest all the foods from the environment (Anderson 1969, p. 373). As a result of the tumultuous encounter between Tāwhiri-mātea and Tūmataunga, a number of rain types were created. Part of Papatūānuku was submerged by the heavy rains that fell:

The bursting forth of the wrathful fury of Tāwhiri-mātea against his brothers was the cause of the disappearance of a great part of the dry land; during that contest a great part of Papa was submerged. The names of the beings who then caused that submergence were Ua-nui and Ua-roa, Ua-whatu and Ua-nganga; that is to say, Great Rain, Long continued Rain, Rain turning to Hailstorm, Furiously Raging Rain; and their progeny were Hau-maringi, Hau-mārotoroto, and Tōmai-rangi – that is to say, Mist, Heavy Dew and Light Dew (Anderson, 1969, pp. 373-374).

These rains became part of Tāwhiri-mātea's extended whānau. Similar but different, in the account by Jones (2013a), when Tāwhaki climbed his way through Ngā Rangitūhāhā⁶⁷, he broke the rock column known as Pou-kohatu. The pou-kohatu served as a plug for the heavens, and this action inadvertently started the conflict between the gods. Soon after, Tāwhiri-mātea caused a catastrophic storm to assail the earth below (pp. 82-83). The name of the winds he sent:

1. Raka-maomao – The Widespread Gusty Winds
2. Mākoi-rangi – The Barbed and Piercing Winds of Heaven
3. Tonga-nui – The Great South Wind
4. Marangai – The North-Easterly Gales
5. Ka-ruia – The Cascading Waters
6. Hauāuru-tūpoki – The Fierce Westerly Gales
7. Tū-a-Raki – The North Tempest

Whiro, Tāwhiri-mātea and Rū-ai-moko led the battle against their tuākana and tēina as widespread flooding inundated the lands below. The fighting was so fierce that Papatūānuku, in her grief, turned her face downwards towards Rarohenga. Many of their offspring perished. This desperate act was known as Te Hurihanga-a-Mata-aho⁶⁸ (p.83).

⁶⁷ The heavens

⁶⁸ The Great Submergence of the Averted Face

TE HURIHANGA A MATAAHO – THE TURNING OVER OF MATAAHO

The sheer grief of Ranginui and Papatūānuku separation was so intense that the tears that flowed endlessly from Rangi became a raging flood, accompanied by hailstones and driving snow. Papa also wept, sending clouds and congealing mists into the sky to her husband. Her tears gathered about her person forming thick, bitter frosts. Their grief was compounded during Te Paerangi as the battle amongst their tamariki intensified, adding to their distress, especially Papa, whose grief became so unbearable, it showed no signs of abating. In effect their tears obscured the sunlight of Tamanui-te-rā, causing darkness and freezing conditions. Their tamariki decide to turn their whaea over so she was facing downwards towards Rarohenga⁶⁹, away from the gaze of Ranginui. Due to the leadership of Mataaho⁷⁰ who directed the turning over of Papatūānuku, this act was known as Te Hurihanga a Mataaho (Buck, 1974, p. 441; Smith, 2011, pp. 53-54 [Māori version] / 135-136 [Pākehā version]).

In the Tainui version of 'Te Hurihanga a Mataaho', it commences when Tāwhaki breaks the pou-kohatu, which in turn triggers aerial and subterranean attacks from Whiro, Tāwhiri-mātea and Rū-ai-moko (Jones, 2005, pp. 82-83). The ensuing conflict causes Papatūānuku, in her grief, to turn her face downwards to Rarohenga, resulting in many of her children perishing in the floodwaters. According to Best (2005) Io-nui gives the command to Mataaho and Whakaruaumoko to turn Papatūānuku face down:

I mua i te haerenga o Tāne-nui-ā-rangi i te ara tiatia ki te toi o ngā rangi taupuru i te otinga o te wehenga i a Rangi rāua ko Papa-tū-ā-nuku, ka hurihia te aro aro o tā rātou hāku i ki raro ki te muriwai hou ki Rarohenga; ko tā rāua potiki e kai ana i te ū i tērā wā, ko Whakaruaumoko. Kāti, waiho atu ana tēnā e rātou hei tānga manawa mōtō [mō tō] rātou hāku; kāti, koia te putake mai o te rū, o te puia hoki e pakanga nei ki a tātou i ngā wā nei (p.249).

Prior to Tāne's ascent of Te Ara tiatia to the uppermost heaven made possible after separating Rangi and Papa, the Earth Mother was turned face downward to the entrance to the Underworld. At that time their youngest child was still on the breast of the Earth Mother. This was Whakaruaumoko, who was allowed to remain with his mother as a comfort to her, and he it is who is the cause of earthquakes and all volcanic disturbances, by means of which he is ever assailing us.

⁶⁹ Underworld, place where the spirits of the dead dwell

⁷⁰ Mataaho was also one of the names of Io, i.e. Io-mataaho (Best, 1976, p. 87)

This drastic action eases the impact on themselves and their numerous offspring. After this was completed, a decision was then made to seek the female element at Kurawaka.

HE ATUA, HE TANGATA HŌ! – A GOD, A MAN HŌ!

Creation narratives and tribal pūrākau⁷¹ often tell us about overachievers, special individuals that behaved in an extra-ordinary way and how they secured their position in the history of the Māori. Typically they were quick witted, resourceful, and fearless individuals. The most well-known tūpuna relative to this kaupapa are Māui-tikitiki-a-Taranga and Tāwhaki. Both were regarded as gods:

"The mythological origins of Maori society are laid out in three major myth cycles, beginning with the creation myth of Ranginui, the sky father, and Papatuanuku, the earth mother. The second sequence of myths deals with the adventures of the demi-god Maui, who fished up the land and brought many benefits into the world for humankind. The third series of myths deals with the life of Tāwhaki, the model of an aristocratic and heroic figure...the central characters in the myths are gods, their progeny and their human descendants. The stories are narrated in prose form, with the notion of an evolutionary sequence conveyed by the storyteller linking the main characters through the traditional method of genealogical recital. Inherent in the genealogy of earth and sky, the gods and their human descendants is the notion of evolution and progression." (Walker, 1990, p.11).

Royal (2005), explains that creation narratives stand as an exemplar for individual and collective models of behaviour to aspire future generations yet to be born:

Creation stories give people a way of looking at their world. These stories tell us about individuals acting in particular ways and securing their position in the world. They stand, therefore, as a model for individual and collective behaviour and aspirations. Legendary heroes act as exemplars of human potential. By capturing the sun, entering the underworld, or fishing up an Island, Māui represents the character of the individual who can bring about change and development in a community⁷².

Māui was chosen at a very young age by the gods for greatness. After his mother committed what she thought was his still-born body to the moana, his body was not lost to the sea, he had not died⁷³. He was found on the beach by a very knowledgeable tohunga known as Tama-nui-ki-te-rangi, who raised Māui and taught him everything he needed to know (Andersen, 1969, p. 192):

⁷¹ Tribal history

⁷² <http://www.teara.govt.nz/en/maori-creation-traditions/page-3>

⁷³ Still-born babies were viewed as malignant spirits if not disposed of. Hence the reason why Taranga, Māui whaea cast his body into the sea

Tama-nui-ki-te-rangi, hastened to see what the thing was about which so many creatures were gathered. He found a man-child, and, taking him home, wakened him to life. Māui dwelt with his ancestor, with Tama'rangi, who related tales, and sang songs, whereby he acquainted the child with the lore of his ancestors (Andersen, 1969, p. 192).

Once Māui attained manhood he seeks out his parents and his tuākana. From there he instructs his tuākana how to improve their cultivations by knowing when to plant, how to plant, and most importantly karakia to ensure a successful crop. He demonstrates his mastery over the elements by way of karakia to destroy Maru-i-te-whare-aitū⁷⁴ crops, by causing them to blacken and wither from frosts and heavy snowfall:

The next day Māui went to prove that he was the greatest gardener once more. But upon seeing that Maru had made his plantation twice the size of his own Māui grew furious and invoked snow to fall upon Maru's plantation. His karakia made the clouds gather above the side where Maru dwelt. At first the snow fell lightly but Maru thought nothing of it. Then it brought on a heavy fall and Māui's incantations began to destroy this opposing crop (Robinson, 2005, p. 61).

Maru-i-te-whare-aitū, also an accomplished tohunga knew that Māui was responsible for destroying his crops, retaliated by invoking, "The powers of the gods of wind, cold air and frost to befall the crops of Māui. The frost cut deep into the heart of Māui's plantation, withering and killing every plant in it" (p.61). Enraged and humiliated, Māui murders Maru by striking him down with his sacred toki – Mā-toritori. From this action, we get a better understanding about Māui that he is not only competitive, but does not like anybody else to be better than him. Māui meets his blind tūpuna whaea, Murirangawhenua where he acquires her sacred jawbone. This sacred jawbone is a metaphor for esoteric knowledge, which Māui obtains through trickery. He turns his attention to another ancestress named Mahuika who he tricks into giving all her nails that contained fire. Robinson (2005) provides a more indepth account of Māui deceitfulness in order to get what he wants:

On the ninth trick Mahuika's pet fantail followed him and observed his deception and returned to its master to say, 'He puts the fire out purposely.' When Māui returned from the creek to take her last nail she was enraged and threw her last nail at him in a blast of flames, which tore out of the cave, setting the whole area on fire. It was lucky for Māui that he had learnt from his mother the way to fly and when he saw the many flames whirling towards him he turned into a hawk to fly away. But he did not entirely escape the flames and his hawk feathers were singed brown because of his trickery. Māui recited karakia to his ancestor Tāwhiri-mātea and to Whaititiri-mātakataka to invoke rain, hoping that this would extinguish the massive blaze over the land but it

⁷⁴ Anderson, 1969, pp. 197-198

was to no avail. Even the karakia that brought on hail and wind to fan the flames did not work because the fire was too large. But when he invoked snow it fell and fell until the fire was slowly put out (pp. 51-52).

Walker (1992) identifies an important aspect of those knowledge holders, 'repositories of wisdom knowledge and tribal lore', that there is an imperative that knowledge is passed on to the younger generation like Māui and Tāwhaki. However, mātauranga is precious and is not obtained easily. Only those who have the right whakapapa, and the right attributes will in time acquire the mātauranga of their elders (p.174). Māui also trapped all the winds in a cave, except the west wind. He blocked off the mouth with rocks. When a need arose, Māui would unblock the cave and allow Te Whānau Puhi-a-Tāwhiri-mātea respite by releasing them into the heavens (Best, 2005, p. 413). Māui exploits did not stop there, he continued to achieve many wonderous challenges, but they are not relevant to this thesis. Although many of these pūrākau were viewed as being fanciful or relegated to that of myths and legends by Pākehā, pūrākau also had a practical function of passing on complex information with ease to rangatahi. Dissemination of knowledge and the pursuit of new knowledge was an important part of ensuring the continuation of a given field of expertise. It also demonstrated that our tūpuna could emulate the deeds of their tūpuna as they shared the same whakapapa, that nothing was impossible to achieve. You are only limited by your imagination (Walker, 1992). Professor Jenny Lee (2009) defines pūrākau as:

... a term not usually associated with academic writing or research methodology; rather, pūrākau is most commonly used to refer to Māori 'myths and legends'. Pūrākau, however, should not be relegated to the category of fiction and fable of the past. Pūrākau, a traditional form of Māori narrative, contains philosophical thought, epistemological constructs, cultural codes, and worldviews that are fundamental to our identity as Māori (Lee, 2009, p.1)

A number of indigenous scholars are included in her paper who further demonstrate the importance of pūrākau for indigenous peoples worldwide. Sami researcher, Koukkanen (2000) describes how storytelling was an integral part of sustaining and protecting local knowledge and oral histories to reflect the memory of a people at place. Merata Mita, a well known Māori filmmaker spent much of her life telling stories to reflect Māori realities through film. She asserts that:

We must not overlook the fact, that each of us is born with story, and each of us has responsibility to pass those stories on. To fortify our children and grandchildren, and help them cope with an increasing material and technological world, we have to tell

them stories which re-enforce their identity, build their self worth and self esteem, an empower them with knowledge (2000).

Lee (2009) states that:

...the need to advance pūrākau as methodology was more than a desire to tell traditional 'stories', recount tribal anecdotes or create cultural vignettes. To make methodological space for a culturally responsive narrative approach was fuelled by the knowledge that our own cultural narratives also offer legitimated ways of talking, researching and representing our stories...

Lee and other Māori academics have used pūrākau as a methodology to further explore how they can create spaces within academia and reclaim power, culture and identity within their own 'cultural and research frameworks.' Many Kura Kaupapa and Wharekura are using traditional pūrākau, such as Māui or Tāwhaki; Māori ancestors who achieved seemingly impossible tasks as a model of empowering rangatahi. One concept that I have often heard is the term the '**Māui principle**' that our tamariki need to embrace their inner Māui before commencing anything difficult or challenging.

HE WHAKARĀPOPOTOTANGA – SUMMARY

In this chapter, Tāwhirimātea, the god of winds and tempest, the main protagonist, is described as totally committed to seeking eternal revenge against those who were responsible for separating his parents, Ranginui and Papatūānuku, especially against Tūmataunga, who suggested killing their parents. This provides the starting point for this thesis: the eternal conflict between mankind and the weather. Sometimes Tāwhirimātea is ascendant, creating havoc and lashing the lands below with devastating storms, hurricanes and floods, but no matter how hard Tāwhirimātea tries, Tūmataunga the god of mankind still prevails. These creation narratives provide a blueprint for acceptable Māori behaviour. Mankind's origins stems from Te Kore, to Te Pō and from Te Whei Ao into Te Ao Marama, darkness into the light, in which the universe was formed and man was created. Humans were therefore descended from the gods, from Ranginui and Papatūānuku, from the sky and of the earth. This cosmological explanation reinforced in a Māori way of thinking how mankind should be courageous like Tūmataunga and aspire to greatness, to achieve the unachievable. This is the model in which Māori ancestors strived to instil in their tamariki. In Ūpoko Tuatoru, I will explore some examples of Mātauranga Taiao Taketake Huareretanga –

the Ethnometeorology of Indigenous Environmental Knowledge from across the world, from central Eastern Polynesia and back to Aotearoa.

TĒPU 2.5: HE WHAKAPAPA MAI PAPATŪĀNUKU KI A APANUI RINGAMUTU⁷⁵ - GENEAOLOGY FROM PAPATŪĀNUKU TO APANUI RINGAMUTU

PAPATŪĀNUKU	=	RANGINUI
Whakaruaomoko ⁷⁶	=	Hinetohu
Manuongaonga		
Uetonga		
Mataroa ⁷⁷	=	Niwareka
Papaku		
Takatakaterangi		
Hinetītama		
Murirangawhenua		
Taranga ⁷⁸	=	Makeatūtara
MĀUI-TIKITIKI-A-TARANGA		
Ruatonganuku		
Ruatongarangi		
Tahu		
Rongotope		
Marunui-a-whatu		
Toi-te-huatahi		
Rāurunui-a-Toi		
Ngā Puna-ariki-a-Whatonga		
Apa		Poutūpari
Rūtanga		Pouturiao
Rongomai		Manutohikura
Tahatiti		Tāneuarangi
Ruatapu		Paikea
Rākaiora		Pouheni
Tamakiterā		Tarawhakatū
Tamakitehau		Nanāia
Tahupukaretu		Porourangi
Hamo	=	
Hau		
Rākaipō		
Manutangirua		
Hingāngaroa		
Tauārai		
Apanui Waipapa		
Rongomaihuatahi		
APANUI RINGAMUTU		

⁷⁵ The above whakapapa is sourced from Erueti Korewha shows the connection from Māui-tikitiki-a-Taranga to the tipuna Apanui Ringamutu.

⁷⁶ Whakaruaumoko?

⁷⁷ Mataora?

⁷⁸ Taranga had Māui Mua, Māui Taha, Māui Pae, Māui Roto, Māui Waho, **Māui-tikitiki-a-Taranga** and Hine Kura

Ūpoko Tuatoru: Mātauranga Taiao Taketake Huareretanga – Ethnometerology of Indigenous Environmental Knowledge

HE TĪMATANGA KŌRERO - INTRODUCTION

This chapter draws upon national and international literature, both historical and contemporary, to expand and strengthen the methodological and theoretical framework that underpins this study and provide a context to distinguish it from other similar research. I will also introduce indigenous cultural practitioners who are leading the field in their chosen area of expertise.

Other than the previous research published by King (2006), there is a dearth of written material on traditional Māori weather and climate forecasting. The lack of relevant literature here in Aotearoa, forced me to explore overseas any research that had been documented on other indigenous peoples who still retained their knowledge of weather and climate. Although there was a plethora of indigenous weatherlore literature available, there were few examples that reflected a similar knowledge base to that of Māori. To provide more clarity, I searched for examples of indigenous peoples who not only had a robust weatherlore system, but were able to influence the weather through karakia or by other external means.

The oldest reference⁷⁹ I came across involved writings by Indian Sanskrit philosophers known as Upanishads (India Meteorological Department, 2012). These writings discussed their theories about how clouds and rain formed; and due to the earth rotating around the sun, how seasonal changes occurred (Dreussen, 2010, pp. 108, 114-115). Nearly 2200 years later a Muslim scholar, Yahya ibn al-bitriq, wrote a detailed Arabic understanding of the weather based on a translation of Aristotle's 'Meteorology' (Schoonheim, 2000, p. XV; Morewedge, 1979, p. 15). In approximately 650 B.C., the Babylonians were also known to be able to predict the weather through a combination of observing cloud formations, optical phenomena such as haloes, and astrology (Allaby, 2004, pp. 9-10). Aristotle's protege Theophrastus wrote a book called Book of Signs, a

⁷⁹ 3000 B.C. see: https://www.sciencelearn.org.nz/interactive_timeline/9-measuring-the-weather-a-timeline

culmination of grounded weather observations. Aristotle and Theophrastus provided the basis for modern meteorology (Woods and Symons, 1894)⁸⁰.

Other than these ancient observations, I have identified a number of indigenous research papers by using Google Scholar⁸¹, including research from Polynesia, early ethnographers, non-Māori and Māori literature pertinent to traditional weather lore.

INDIGENOUS ENVIRONMENTAL KNOWLEDGE OF WEATHER AND CLIMATE

Using Google Scholar, I sourced a number of relevant published research papers. Over the last twenty years, more indigenous academics have been leading the research in this space. This trend is exemplified by the articles produced with and by traditional rainmakers from Africa, Inuit people of the Arctic North, the First Nations from Te Whenua Moemoeā (Australia), and Polynesian people from Hawai'i and Samoa. The following First Nations indigenous peoples are further examples of cultural practitioners who are skilled in not only predicting the weather, but also causing rain to fall for their continued survival during times of drought. It should also be noted that climate change has had a profound impact on the traditional methods of weather and climate prediction because these cultural practitioners depend on the natural environment to understand what is happening in order to survive.

Africa

Obedi Osore Nganyi – Leader Nganyi Rainmaker: I see myself as a scientist because the skill has been passed on to us from our fathers, who learned it from their fathers. It is in our blood and we can't run away from it. I know the science of rainmaking is in me and in my people. I was born with it (McDonald, 2015)

Lack of rain is always at the forefront of African tribal societies' minds for their continued survival, including an adequate supply of water for their stock. It is no surprise that there is much literature based on traditional rainmakers and indigenous knowledge related to traditional weatherlore throughout Africa (Speranza, Kiteme, Ambenje, Wiesmann, & Makali, S. 2010; Zuma-Netshiukhwi, Stigter, & Walker, 2013; Kwanya, 2014; Pepin, 1996;

⁸⁰ I thought seriously about adding examples of Theophrastus's contribution to meteorology in this chapter, but after further discussion decided not to. Much of Theophrastus's work reflects NWTW model.

⁸¹ Other library search engines used were University of Waikato Library, Worldcat, JSTOR, Google, Bing, and Yahoo. None identified literature that I had not seen before.

Orlove, Roncoli, Kabugo, & Majugu, 2010). These studies demonstrate the depth of localized knowledge that is still retained by indigenous peoples. The majority of the research provides a collation of environmental, seasonal, and climatic indicators and usually explores the complementarity or parallels between mainstream meteorology, climate science and traditional weatherlore.

My [Māori] ancestors were also known to cause the rain to fall, to raise storms to kill, and to protect their own people; and when needed, to stop the rain from falling. I identified a number of African Rainmakers to investigate how these people were able to make the rain fall and also to provide an insight into their abilities as rainmakers in one of the world's driest continents.

Researchers from around the world are investigating how Nganyi rainmakers (NRs) from Kenya can 'cause' the rain to fall. Paul Guthiga and Andrew Newsham (2011) conducted research to ascertain how the NRs have predicted the weather with unerring accuracy. Kenyan farmers had to rely on NRs to cause the rain to fall to ensure that their crops will not fail. Predictions can be either short- or long-term. Due to the efficacy of the NRs, many international researchers have conducted research with these cultural practitioners to better understand how mainstream science and traditional Nganyi weatherlore can improve the accuracy of weather predictions. The researchers found out how the NRs were able to distinguish subtle changes in the natural world that would be unnoticeable to most people, such as the behaviour of plants and animals before the onset of rain. Here are some examples:

- The behaviour of ants
- Bird song
- Croaking of frogs and toads
- Air currents
- Evergreen trees – leaves turn in a certain direction

All these environmental signs mean that rain is imminent. The researchers have identified the local forests as places of rich biodiversity that act as shrines; places where these environmental indicators are used to predict the weather or to act as early

warning signs. These shrines are viewed with deep respect as they are also the resting places of former NRs. The key purpose of the PAR⁸² project was to “improve the ability of local communities to cope with climate variability by developing an effective warning and dissemination system (Guthiga & Newsham, 2011). This system will be based on the combined knowledge of and input from Indigenous Knowledge (IK) experts and meteorological scientists” (p.105). Through their investigation, Guthiga and Newsham tried to demystify the NRs by explaining that their abilities are physical ones, based primarily on observation, and not metaphysical. This is the main problem when mainstream science, in this instance Kenya Meteorological Department (KMD), engages with indigenous knowledge practitioners like NRs; they are unfamiliar, and sceptical at first. It is hard to gauge the sincerity of the KMD research team, as it seems that KMD staff are reluctant to give NR their due respect. I find it ironic when Guthiga states, “The rainmakers have become more willing to share information with the PAR project, unlike in the past when they held it as ‘elite knowledge’ for only a few people” (p.108), as it mirrors Western Science. The KMD view NR rainmaking knowledge as “Shrouded in secrecy, mainstream science always view themselves as the only true authority and that IK practitioners are an inferior form of knowledge, an alternative science”. The key research question is, can the NRs actually make the rain fall? The KMD concluded that NRs cannot in fact “make” rain fall, but they have acute observational skills that make them aware when rain is imminent.

A series of short films entitled, ‘The Rainmakers of Nganyi’ by Steve McDonald (2015) documented another research project with the NRs, providing a more personal approach to better understanding the NR way of causing rain to fall. The research team included Professor Maria Onyango and Dr Regina Ngunja from the Jaramogi Oginga Odinga University; Dr Gilbert Ouma from the University of Nairobi and Sam Mwangi from the KMD. The research team’s interest was aroused when they heard about the story of a community that did not believe or accept regional weather or climate forecasts, but remained steadfast in their belief in the NRs.

⁸² Participatory Action Research (PAR)

In the films, leading NRs Obedi Osore explains, “When I blow into the pot, you will see the clouds come in and it will start to rain.” Peter Mwanyangi, a curator from Kisumu National Museum of Kenya states that, “The whole of this region knows the Rainmakers of Nganyi, because whatever they say always come to pass. They prove it.” As mentioned by Guthiga and Newsham (2011), mutual scepticism from both parties was evident at the beginning of the interaction, but this was slowly replaced by mutual respect after gaining a better understanding of each other’s ways of knowing how to predict or forecast the weather. The researchers noticed striking similarities between scientific forecasts and those of the NRs. Dr. Ouma learned that “the reaction of the animals, the reaction of the plants to atmospheric conditions is so sensitive that they capture it before our instruments capture it.” The researchers observed the NRs sitting amongst their shrines in well established, indigenous trees, in bush containing reptiles, birds and insects. Former NR ancestors are also buried in this small patch of forest. It is sacred to them. They pray to their ancestors and the rain starts to fall. The researchers saw this happening but could not explain fully how it happened.

Although the NRs were engaging and sharing their Indigenous Knowledge with the researchers, there were some aspects that they kept to themselves even though the researchers pushed to collate as much as possible so they could become the authority rather than the NRs. The researchers’ rationale is that the knowledge will be eroded over time and will eventually be lost if it is not made public. One of the responses to the researchers after asking for a deeper meaning regarding plant roots was negative. The NRs believed that if they gave away parts of the knowledge meant only for the initiated, it would anger their ancestors. It was their secret.

The Kenyan Meteorological Department and the NRs provided a consensus-based weather forecast issued via radio stations first thing in the morning in order to improve accuracy. The senior NRs, Obedi Osore, commented that he viewed himself as a scientist as his NRs skills had been passed on to him from his father and his father before him through a form of whakapapa: “I know the science of rainmaking is in me and in my people. I was born with it” (McDonald, 2015).

There are two well-known rainmaker cults: one is the Marumbi Karivara Rain Cult (Mujere, 2007) and the other is the Matriarchal Rain Queens (Joubert, 2011). The Marumbi Karivara Rain Cult is located in Gutu, Zimbabwe. King Chamutsa Mugomberwa broke tradition by conferring his rainmaking powers on his daughter Marumbi Karivara, instead of his eldest son, while on his death bed. He vomited up the water stone that kept him alive and asked his daughter to swallow the ritual stone. He also handed over all his rainmaking charms and gear. Immediately after this ritual, Chamutsa died. Marumbi became possessed by the rain spirit which had possessed her father. After a time people observed that although the land was in the grip of a bad drought, Marumbi always brought in fresh vegetables from her garden and the cattle that she tended remained healthy. This did not go unnoticed. An oasis developed. Every where else it was dry and lifeless. The rain charms that her father taught her caused the rain to fall. Another senior Chief from Gutu Mabwazhe sent Marumbi to the Mwari Shrines to see who, out of all the rainmakers, could be successful in making rain. Marumbi was the only one who successfully caused rain to fall. The area that Marumbi settled became the most well watered in Gutu. Being a reputable rainmaker is inextricably linked to the rivers, the waterways and to tribal political power. Successful rainmakers make successful monarchs who live healthy, long lives. Unsuccessful rainmakers are monarchs who do not live long and productive lives.

I have presented two examples of rainmaking from Kenya and Zimbabwe; both show a deep spiritual link to their ancestors, to their gods and goddesses. This was done to demonstrate other examples of indigenous weatherlore, other than Māori that have a strong spiritual component, such as rainmaking. Harsh, unforgiving climates demanded strict adherence to upholding the lore and to respect their ancestral rainmakers legacies. To be inattentive and not to follow the lore was said to anger their ancestors and compromise their abilities as a rainmaker (McDonald, 2015).

Arctic Circle

Inuit

The Inuit are one of the few indigenous groups to settle within the Arctic Circle. They have managed to exist in one of the most extreme environments on Earth – Nunavut-

Canada. Climate scientists have conducted a number of research projects in this location to gain a better understanding of how the Inuit people have endured in this harsh landscape over many generations and remained resilient after experiencing many environmental challenges from the impacts of climate change. Weatherhead, Gearheard and Barry searched for changes in weather characteristics to match the reports from the Inuit people (2010, p. 1). The most significant change, consistent across the Arctic region, is increased weather variability (Krupnik & Jolly, 2002; Huntington & Fox, 2005; Nickels et al., 2006 as cited in Weatherhead, Gearheard & Barry, 2010). Essentially a hunting people, the ability to read the weather patterns and how weather phenomena interact with the rest of the environment is critical to travelling safely between home and hunting grounds. Senior Inuit Leader Rosemarie Kuptana explains to the United Nations Framework Convention on Climate Change:

Inuit are a hunting people who live primarily by the sea and at the ice edge. We depend on land and marine mammals, on fish and other Arctic renewable resources for food and other necessities. Inuit culture and our traditional lifestyles are closely adapted to the natural rhythms and processes of the Arctic climate and environment. The traditional knowledge of my people is a vast storehouse of information gathered over many thousands of years. In addition to our natural dependence on the Arctic environment for food, my people have a deep and spiritual relationship with the land, sea, ice, animals and climate of the Arctic as it is today. The Arctic that we know has shaped our culture in ways too numerous to mention. It has made us who we are; Inuit, people of the Arctic (Kuptana, 1996).

The researchers gained an invaluable insight into the stark reality that was the Inuit's everyday life:

Experienced Inuit hunters have a great depth of knowledge of the environment and weather patterns, founded on generations of wisdom and combined with a lifetime of experience on the land. Because Inuit knowledge of the environment, including weather, has always been tied directly to decisions that could mean the difference between life and death, it comes with a precise, descriptive language, careful observation techniques, and a focus on practice, so that knowledge is constantly tested and refined (Weatherhead et al, 2010:1).

Like other indigenous peoples, the Inuit have developed numerous environmental indicators to navigate their way safely across an often treacherous landscape. The tradition known as `anijaaq'⁸³ prepared Inuit youngsters to learn how to predict the weather. Elders achieved this by instilling a lifelong discipline by getting them up early to observe the conditions of the sky and then report back what they believe the weather

⁸³ Traditional Inuit wayfinding

will be like and why. The youngsters had to provide a specific answer to support their prediction, such as the position of the stars, the type of cloud patterns they saw, and in what direction the wind was blowing. These skills were honed over a lifetime of subsistence living. The following are some examples of Inuit weather signs:

- Dogs or ravens seen moving around during high winds or a blizzard, indicating that the storm's energy is about to end
- Stars turn a reddish hue, temperature becomes extremely cold
- Stars not twinkling, milder weather expected
- Star behaving like a flame in a draft, windy weather expected

Understanding the meaning of certain cloud patterns was critical in order to survive, especially cloud patterns that indicated a change from fine weather to a violent storm. When long, thin, black clouds started to form above the horizon to the north after a number of calm, fine days, locals would know this sign as 'Ugjunquaq' or the 'bearded seal'. Any local who saw this indicator would get off the moving ice or off the sea to safety as the wind starts to blow continuously, growing in intensity. If these types of clouds appear in the North North East, then a bad storm is imminent, which will persist in that locality for a number of days.

Unfortunately, Inuit have noticed that age-old weather signs are no longer consistent or accurate. Hunting has become a lot more dangerous out on the ice. Currently the older generation still predict the weather by getting up early in the morning and looking up at the sky. A Local Inuit describes his frustration that his traditional skills of weather forecasting are no longer reliable:

I've always watched the weather and it is more unpredictable than in the past. Sometimes I guess that it would be a clear day and then all of a sudden bad weather comes. My predictions used to work and I used to give advice to younger people about going out, whether to go out or stay home. But I can't do that today because it is so unpredictable (Qaqqasiq, 2001).

The main climatic impacts observed by the Inuit are thus increased weather variability and unpredictability. Hunters need to take extra precautions, and carry extra gear just in case they get caught out (Weatherhead et al, 2010).

Australia

The Aboriginal peoples of Australia have often been recognised as the oldest surviving indigenous culture on the planet (Behrendt, 2012, p. 17). During that time they developed, over many generations, localised survival skills to endure often adverse climatic conditions (Anonymous, 2003, p. 1). Many mainstream academic researchers find it difficult to accept the influence of the supernatural world in a research-based science context, especially when Aboriginal peoples talk about their own creation narratives regarding climate, called the "Dreaming" (p.1). Behrendt references a Yolgnu elder, Silas Roberts, who describes Dreamtime in this way:

Aboriginals see themselves as part of nature. We see all things natural as part of us. All the things on Earth we see as part human. This is told through the ideas of Dreaming. By Dreaming we mean the belief that, long ago, these creatures started human society. These creatures, these great creatures, are just as much alive today as they were in the beginning. They are everlasting and will never die. They are always part of the land and nature, as we are. Our connection to all things natural is spiritual (Behrendt, 2012, p. 52).

Clarke (2009) is unique as a non-indigenous researcher, as he goes where many of his colleagues refuse to go; he aims to provide a fuller understanding of Aboriginal environmental knowledge, including the spiritual realm. The focus of his research is not too dissimilar to mine, like how Māori ancestors were able, through ritual and deep spiritual beliefs, cause rain to fall, thunder and lightning to resound, prevent floods, or raise gale force winds as a weapon against enemy tribes. Many of the components of MEK are identified by Clarke (2009). Clarke also describes in detail the Aboriginal world view, which involves the 'continuity and permanence of all things'. The Dreaming narrative is central to Aboriginal peoples' ancestors beliefs, the practices they introduced, and the tangible objects and places that they left behind in their country (p.80). There are many interesting sections in Clarke's (2009) paper, particularly the description of how an ancestor, 'Gartuk', caught powerful storms in bags, only to unleash them later upon other people (p.82).

The central theme of Clarke's (2009) paper is how Aboriginal 'weather makers' are able to change the weather. Depending on the region, weather makers can be either men or women. According to Rose (1956), desert dwellers consider that "rain cannot occur unless the appropriate ceremonies are performed by them. So close is the self-world

relationship that they consider the rain to be as dependent on them as they are on it” (as cited in Clarke, 2009, p. 89). There were many known “Rain” people across Australia. Some were formally trained in the knowledge to change the weather. These rainmakers believed that their abilities came from either their Dreaming ancestors or from powerful spirits like the Rainbow Serpent (p.89). Like many indigenous peoples, most people had basic environmental observational skills in order to survive, so when local attempts failed and the need was great, especially during a drought, these special individuals were invited to conduct the required rituals to cause rain to fall.

Aboriginal peoples have a similar system of tapu, a strict adherence to protocols, such as those involved in entering a known burial cave. The belief is that any transgression against the spirits will result in death by lightning, droughts, drowning or devastating gale force winds (p.86). Weather-making could also be used as a weapon. Clarke provides a number of examples that illustrate Aboriginal peoples’ ability to hurt others. Groups from Western District of Victoria feared their neighbours’ ability to send lightning and heavy rain to cause injury, and the Anangu people blamed weather-makers for creating severe frosts that killed plants (p.90). Another example occurred recently in 1984, when an elder used his “drought stick” to punish a farmer who had killed his dogs, by thrusting this stick into the ground, causing a drought (p.93).

Most Aboriginal hunters relied on the movement of the stars in order to understand the changing seasons, the migration patterns of certain animals and the fruiting times of particular flora. When the Pleiades constellation, known as Kungkarangkara, was seen rising, it heralded the winter weather, the cold winter months.

Weather-makers also used tools to augment their skill, such as:

- Ritual
- Song
- Frog calls
- Boomerang
- Pearl Shells
- Burning sticks

- Smooth white stones
- Seasonal knowledge
- Weather-making places

Weather-makers identified special places that amplified their abilities. The areas where their 'tools' are sourced are also recognised as areas in which to conduct these types of rituals. These Weather-makers relied upon strength of conviction, their rituals, rainmaking gear and localised knowledge to be successful. Clarke (2009) states that these practitioners were given a duty by their fathers, handed down to them to uphold the sanctity of their skill. They all had a strong sense of responsibility to their ancestors and to their people. A key outcome from Clarke's research was the identification of how important seasonal calendars are as regional tools for gaining better understanding and greater insight into the relationship between climate and the environmental landscape in Australia.⁸⁴

Frances Bodkin, a D'harawal knowledge holder from Sydney and the South Coast regions, has published a number of books that contain traditional D'harawal stories that were used as teaching tools in order to "impart to the youngest members of the clan the laws that governed the cultural behaviour of clan members" (Bodkin & Robertson, 2013:2). Bodkin explains that her people had figured out a very long time ago that children learned better and quicker when given a problem to solve, as opposed to giving them the answer (p.3). Further explanation is given below regarding the multi-layered nature of these 'Dreaming Stories' that contain ancient wisdom and knowledge gained over tens of thousands of years (p. 2). The first layer involves secrets that are not included in the pūrākau but are remembered separately. Only those who are deemed worthy recipients are holders of these secrets. The second layer involves clan law; laws that had to be obeyed. The telling of the stories included the reiteration of these laws and how they were to be applied in real life. The last layer threaded amongst these tribal narratives involved the lessons or morals one learned in order to live in sync with the environment. These lessons were taught to all members of the kin group, including any visitors (p.2.). With this book, Bodkin has provided a health and safety cultural plan to

⁸⁴ To link to this article: <http://dx.doi.org/10.1080/02757200902867677>

ensure that people live in harmony with each other and the environment. The following table is a D'harawal Seasonal Calendar. The D'harawal people were located near the southern shores of Port Jackson – Sydney, to the northern shores of Shoalhaven River, and from the eastern shore of the Wollondilly River to the coast⁸⁵.

TĒPU 3.1: THE D'ARAWAL SEASONAL CALENDAR

MONTH	JANUARY - MARCH	APRIL - JULY		AUGUST	SEPTEMBER - OCTOBER	NOVEMBER - DECEMBER
SEASON	Burran	Marrai'gang	Buraggin	Wiritijibin	Ngoongungi	Para'dowee
CLIMATE TYPE (D'arawal)	Gadalung Marool	Bana'murrai 'yung	Tugarah Tuli	Tugarah Gunya'marri	Murrai'yunggory	Goray' murrai
CLIMATE TYPE (English)	Hot and dry	Wet becoming cooler	Cold, frosty, short days	Cold and windy	Cool, getting warmer	Warm and wet
SEASONAL OUTCOME	Male kangaroos aggressive Weetjellan blooming	Quolls seeking mates Lilypilly ripens	Echidna seeking mates Burringoa flowering.	Lyrebird building mounds, Marrai'uo flowering, Boo'kerrkin flowering, gentle spring rains	Flying foxes appear Miwa Gawaian in flower	Summer heat starts Stable weather

Over the last decade, I have engaged with a number of Aboriginal academics, such as Professor Larissa Bahrendt, Professor Bob Morgan and Associate Professor Jason De Santolo. My colleagues and I from MAI Ki Waikato were very privileged to be hosted by the University of Technology (UTS) – Jumbunna Institute for Indigenous Education and Research in 2016. We all gained a unique insight into their worldview. Professor Bob Morgan shared an interesting true story with me after finding out about my thesis topic. He told me how:

Devastating storms like Cyclone Tracy back in 1974 totally wiped Darwin off the face of the earth. But my countrymen versed, in their own traditional environmental knowledge, saw the weather signs of a violent storm approaching...vast flocks of birds leaving the area, ants building on higher ground. But what really spooked them was when they saw two traditional enemies, a snake and a goanna basking together in the sun on the same rock. They knew something bad was going to happen and it was going

⁸⁵ See <http://www.bom.gov.au/iwk/calendars/dharawal.shtml>.

to hit soon so this mob all packed up and moved out of harm's way and survived. Many people saw my mob packing up and moving out, but thought nothing of it (B. Morgan, personal communication, 21 June 2015).

He also told me that after that example of how local Aboriginals knew that a destructive storm was going to hit Darwin, it was a catalyst for research institutions like CSIRO⁸⁶ to explore if there was any basis to how these indigenous peoples managed to identify the storm. Secondly, was there anything else that they could learn from one of the most ancient peoples of the world?

It is disappointing that the majority of publications on Aboriginal environmental knowledge (AEK) were conducted by non-indigenous researchers. Hopefully our Aboriginal relations from Te Whenua Moemoeā will encourage their own mob to conduct similar research in the near future.

Hawai'i

Like their relatives the Māori, and other indigenous peoples already mentioned, Hawaiians do not have a wealth of literature on traditional Hawaiian weatherlore. Even with the resurgence of traditional Polynesian navigation, there is still no definitive book that captures the localized weather and climate knowledge of the Hawaiian archipelago. Due to the devastating impacts of colonization and the overthrow of the Kingdom of Hawai'i in 1893, the traditional passing of knowledge down to the next generation of cultural practitioners and experts was interrupted, but not completely lost. Hawaiians were brought up to look out for hō'ailona or 'signs' that warned of misfortune or even death. Certain families have their own hō'ailona, such as ānuenue or rainbows (Pukui, Haertig, & Lee, 1972, pp. 53-55). Modern Hawaiians have made huge developments in their efforts to understand the cultural practices of their ancestors, such as the use of kūahu, heiau or raised stone shrines to conduct ceremonial sacrifices and observations by Hawaiian priests known as Kahuna kilokilo, kahuna kilo lani or Nanauli. These were experts who specialized in observing the signs in the heavens and the elements, and their relationship to the environment.

⁸⁶ The Bureau of Meteorology – Australian Government in partnership with the Aboriginal and Torres Strait Islander Commission and Monash University's centre for Indigenous Studies has since 2002 launched a website to formally recognise Indigenous Weather Knowledge. See: <http://www.bom.gov.au/iwk/>

Tēpu 3.2 identifies numerous Hawaiian cloud types referenced mainly from three well-known Hawaiian authors, David Malo (1951) and Mary Kawena Pukui and Samuel H. Elbert (1986). It is unknown why there are a number of gaps in the table. Perhaps it reflects the impacts of colonisation on Hawaiian environmental knowledge?

TĒPU 3.2: HAWAIIAN AND HAOLE⁸⁷ NAMES OF CLOUDS AND THEIR MEANINGS⁸⁸

HAWAIIAN NAME	HAOLE NAME, CLOUD TYPE	EXPECTED WEATHER CONDITIONS AND REFERENCE
`OHU	Fog, mist	Fine weather (Pukui & Elbert, 1986, p. 278).
`ŌPUA	Cumulus clouds. Narrow and long, hanging low on the horizon. Billowy clouds. Often interpreted as omens.	Potentially a storm, rain-cloud, waterspout (Malo, 1951, p. 12; Pukui & Elbert, 1986, p. 293).
AO-`ELE`ELE	Cumulonimbus. Mainly heaped black clouds	Inauspicious, thunder and lightning threatening clouds (Malo, 1951, p. 12; Pukui & Elbert, 1986, p. 416).
AO-`ŌNOHI	Cloud with rainbow colours	(Pukui & Elbert, 1986, p.416).
AOKŪ	Dark cloud	Rain expected (Pukui & Elbert, 1986, p. 416).
AO-LOA	Stratus. Long cloud, a high or distant cloud; stratus cloud along the horizon	(Pukui & Elbert, 1986, pp. 28, 416).
AO-NĀULU	A shower cloud	Sudden shower imminent (Pukui & Elbert, 1986, p.263).
AO-PŌPOLOHUA	Purplish, blue cloud	(Pukui & Elbert, 1986, p.263).
AO-PUA`A	Cumulus clouds piled together, like a mother pig and her piglets near her.	(HawaiiHistory.org, n.d., para 2) Famous Kona clouds. A sign of good weather and no storms
HOOPEHUPEHU, AO-PEHUPEHU	Swollen clouds, continually growing cumulus, typical of summer. Drifting with the trade winds	(Malo, 1951, p. 12; HawaiiHistory.org, n.d., para 2). These clouds pick up moisture

⁸⁷ European name

⁸⁸ Pukui & Elbert, 1986, pp. 28, 414, 416.

		and darken at the base, then release rain on the windward mountain cliffs
KAHA'EA, PĀLĀMOA,	Cirrocumulus. Billowy streak cloud, mackerel sky	Indicates changeable weather within 6-12 hours (Malo, 1951, p. 12).
KEAOPUKA	Rain clouds - 'Pathway of the Rain Clouds'.	Rain clouds forming water spouts head for land. When seen people know that the water spouts move inland causing destruction. Floods and heavy rains follow (Kahele, 2006, pp. 71-72).
KEA, KEOKEO	White clouds	(Malo, 1951, p. 12).
KONA-NUI-A-NIHO	'Great Kona that bites with teeth.' Strong Kona storm	(Pukui & Elbert, 1986, p. 165).
ONOHU-ULA	Red eye ball; rainbow tinted cloud	(Malo, 1951, pp. 12, Pukui & Elbert, 1986, p. 416).
ULIULI	Blue-black cloud	(Malo, 1951, p.13).

Clouds were viewed as a way to understand what is happening in the sky. Their shape, height, colour and sequence allowed kahuna to predict with high accuracy what would be the outcome. Hawaiian navigators relied on reading the clouds to provide the necessary information required to get from point A to point B. Hawaiian navigator Nainoa Thompson reflects on his formative years, under the tutelage of Mau Piailug:

Mau taught me to call clouds that look like this "the road to the wind." Imagine at the far horizon there is a factory producing the clouds and, like smoke from a haystack, they follow the wind. This road indicates the wind is coming from the horizon. and because the road is straight, the wind is steady. If you see the road curve--it means that the wind direction will change and the way it curves will tell you the new direction. It is interesting to me that meteorologists call this kind of phenomenon "cloud streets", pretty close to Mau's term "Road of the Wind" (Kawaharada, 2001)

A key characteristic I noticed with weather classifications, such as rain, it is location specific. The topography, local climate, vegetation all combine to produce a rain that behaves in a particular way. The following table identifies rain types, a brief description including the location observed:

TĒPU 3.3: HAWAIIAN NAMES AND DESCRIPTIONS OF RAIN TYPES⁸⁹

HAWAIIAN NAME	DESCRIPTION	LOCATION AND REFERENCE
`AWA	A cold mountain rain	Makawao, Hawai'i (Nakuina, 1990, p. 125).
HE`ENEHU	Misty rain. When the He`enehu rain is seen, local Hilo fisherman know that the nehu are running.	Hilo, Hawai'i (Akana & Gonzalez, 2015, p. xvi).
KANILEHUA	"Rain that the Lehua flowers drink" or "rain that makes flowers rustle". A heavy, misty rain that falls between the hours of 8 and 11am, and between 1 and 3pm. It rains for nearly an hour then it disappears. Heavy downpour.	Hilo, Hawai'i (Nakuina, 1990, p. 124; Akana & Gonzalez, 2015, p. 51).
KAUMUKU	A rain squall	Papawai, Māui (Akana & Gonzalez, 2015, p. 51)
KILIUA	Gentle, misty rain	Waikāne, O`ahu (Nakuina, 1990, p. 124).
KĪ PU`UPU`U	Chilly wind and rain	Waimea, Hawai'i (Nakuina, 1990, p. 124).
KONA KŪ	Rainfall with a wind coming from a southerly direction, abundance of rain	Kona, Hawai'i (Pukui & Elbert, 1986, p. 165; Malo, 1951, p. 14).
KONA LANI	Wind with slight showers	Kona, Hawai'i (Pukui & Elbert, 1986, p. 165; Malo, 1951, p. 14).
MOLOLANI	The Mololani rain falls in Kāneōhe	Kāne'ōhe, O`ahu (Akana & Gonzalez, 2015, p. xvi).
TUAHINE	Misty rain famous in Mānoa.	Mānoa, O`ahu (pp.251-253). See also Kuahine (pp.113-120).
UA KEA	White rain	Hilo, Hawai'i (Nakuina, 1990, p. 125).
`ULALENA	Reddish rain	Piīholo, Māui (Nakuina, 1990, p. 125).

⁸⁹ Key literature utilised to populate the Rain Table are sourced from Akana & Gonzalez (2015), Nakuina (1990, pp. 123-125); and Pukui & Elbert (1986).

Colette Leimomi Akana (better known as Momi) and her daughter Kiele Gonzalez (2015) published a compilation of Hawaiian rain names and their meanings, titled *Hānau ka ua*. They became inspired to write this book based on a birth chant for Queen Emma⁹⁰. Both Momi and Kiele describe the strong, spiritual interconnectedness between their kupuna⁹¹ and the natural elements:

They were keen observers of their environment, with all of its life-giving and life-taking forces. They had a nuanced understanding of the rains of their home. They knew that one place could have several different rains, and that each rain was distinguishable from another. They knew when a particular rain would fall, its color, duration, intensity, the path it would take, the sound it would make on the trees, the scent it carried, and the effect it had on people (p.XV).

I met Momi and Kiele in 2016 at the Naisa Conference held at Manoa, O`ahu. Akana invited my wife and me to visit a number of wāhi pana⁹² on O`ahu. One of the heiau visited was Kūka`ō`ō, located at the Cooke Mansion. At this special location, Momi noticed the Tuahine rain falling and moving towards us; it is a very light, misty rain that starts up in the mountains and moves south towards the Cooke Mansion. Momi explained that “when the Tuahine rain reaches the mansion it disappears. It caresses the skin and evaporates” (Personal communication, August 30, 2016). Underneath the Kūka`ō`ō Heiau is a cave where a brother and sister took refuge. They broke the kapu⁹³ by eating in that place. The sister was turned into the Tuahine rain and the brother into the Kahaukāne wind, which pushes the Tuahine rain (Akana & Gonzalez, 2015, p. 253).

Momi and I compared notes and were not surprised in the least to find that many of our rain names are the same or have similar meanings, with slight differences due to dialect. As we were sightseeing, Momi pulled over near the Makapu`u Lookout. She had noticed an easterly breeze coming off the ocean towards us, which she said was a malanai. I asked her if it is associated with rain and she replied yes.

Hānau ka ua is an invaluable taonga for the Hawaiian people; it enables them to recapture the beauty and depth of intimacy of traditional knowledge about the weather. The level of description about how each rain depicts the area, its topography, and the

⁹⁰ Married Alexander Liholiho – King Kamehameha IV

⁹¹ Ancestor

⁹² Sacred sites, sites of significance in Hawai`i.

⁹³ Means the same as tapu or sacred

spiritual components that are expressed and energized through mele, hula and musical instruments, are truly remarkable.

I have been told that there are many wind names in Hawai'i. Momi and Kiele are currently working on a wind version of their Rain book. I asked Momi if she knew whether the names of the winds in the book, *The Wind Gourd of La`amaomao*, were real Hawaiian wind names. She replied that the narrative is an ancient one and the names are real. Many of the wind names in the above table are sourced from the Wind Gourd of La`amaomao, written by Nakuina (1990).

TĒPU 3.4: HAWAIIAN NAMES AND DESCRIPTIONS OF WIND TYPES⁹⁴

HAWAIIAN NAME	EUROPEAN NAME	WIND DIRECTION	LOCATION AND REFERENCES
ʻŪKIU	Chilly north wind	N	Makawao, Hawai'i (Nakuina, 1990, p. 125).
ʻEKA	Breeze		A breeze that calls forth the canoes of Kona because it is good for fishing (Nakuina, 1990, p.123).
HAU	Cold, frosty breeze		Kapalilua, Hawai'i; Kula, Māui (p.123).
HOLOPALI	Wind `running along a cliff'		Ka'a'awa and Kualoa, O`ahu (p.123).
IHUANU	Wind blowing from the uplands		Cold nose. Kawela, Moloka'i (p.123).
KIU	Strong, moderately cold wind	NW	Kiuanu of Kalāheo and Kiukainui of Ko'olau – Kaua'i (p.124).
KAHAUKĀNE (Tuahine wind)	A wind that descends from the mountains pushing the		Manoa, O`ahu (Akana & Gonzalez, 2015, pp. 252-253)

⁹⁴ Nakuina, 1990, pp.123-125.

	Tuahine rain south		
KO'OMAKANI	Stormy wind		Māhā'ulepū, Kaua'i (Nakuina, 1990, p. 124).
KOHOLĀ-LELE (Leaping whale), KOHOLĀ-PEHU (Swollen whale)	Wind blowing from east to west	East to west	Hāmākua, Hawai'i; Kīpahulu, Māui (p. 124).
KONA	Southerly, famous leeward wind. Kona-mae = cold Kona wind	S	Hawaii (Pukui & Elbert, 1986, p. 165; Malo, 1951, p. 12).
KUMUMA'OMA'O	Easterly	E	Kaluako'i, Moloka'i; Kamaile, O'ahu (Nakuina, 1990, p. 124).
LELE-ULI	Gusty, gloomy wind		(p. 124).
MALANAI	Gentle breeze, a trade wind	Easterly?	Kailua, O'ahu (p. 124).
MĀUNUUNU, 'APA'APA'A	Strong, blustery wind		Wai'alaie and Pu'uloa, O'ahu; Kohala, Hawai'i (p.125).
MOA'E	Northeast Trade wind	NE trade winds	Hāna, Māui (p.125).
NĀULU	Wind associated with sudden showery rain		Kawaihae, Hawai'i; Kāhala and Kapālama, O'ahu (p.125).
PUAHIOHIO	Whirlwind		Nu'uanu, O'ahu (p.125).
ULUMANO	Southerly breeze	S	A strong local wind blowing from a given direction – Puna- Hawai'i; Kāne'ohe, O'ahu (p.125).
WAIPAO	Cool breeze		Waimea, Kaua'i (p.125).

In Tēpu 3.5 I have identified some further examples of Hawaiian Environmental Knowledge of weather and climate, namely Hawaiian weather indicators:

TĒPU 3.5: HAWAIIAN WEATHER INDICATORS

HAWAIIAN NAME	INDICATOR	EXPECTED OUTCOME AND REFERENCES
HOKU (Twinkling Stars)	The stars are seen twinkling during fine weather	Strong winds will strike the islands soon. “He ino koe, ke imoimo nei na hoku.” “A tempest is near; the stars are twinkling” (Fornander, 1920, p. 86).
ʻIWA (Frigate Bird)	ʻIwa seen flying out to sea.	The rough sea will gradually calm down (Pukui, 1983, p. 215).
KAHEA (Red patchy clouds)	<ol style="list-style-type: none"> 1. Clouds in the eastern sky are red and patchy in appearance before sunrise. 2. Same clouds lying with a smooth appearance over the mountains in the morning. 	<ol style="list-style-type: none"> 1. Rain expected (Malo, 1951, p. 13). 2. Known as a Papala. Rain expected.
KONANE (Spotted cloud)	Long bouts of fine dry weather, and then thickly covered with white clouds like a white spotted dog, such spotted clouds were called “Konane Board”.	Violent storm, gale force winds and torrential downpour imminent. It will last for as long as the previous calm had prevailed (Fornander, 1920, p. 86).
KONA (Southerly wind)	<ol style="list-style-type: none"> 1. Prevailing wind blowing from the (Kona) south for nearly a month, and heads of the clouds leaned towards the east. 2. Nanauli (Weather Prophet) observed the head of a cloud was leaning towards the west or to the south - Kona. 	<ol style="list-style-type: none"> 1. Kona wind is about to subside, tomorrow the easterly breeze is imminent (p. 86). 2. The Kona wind is about to arrive.
NEWE-NEWE (Yellowish cloud)	Yellowish cloud seen hanging low over the horizon.	A sign of very calm weather (Malo, 1951, pp. 12-13).
OPUA	1. Leaves of the opua tree pointing downwards.	1. Blustery weather or a storm is expected (p. 12).

	2. Leaves of the opua tree pointing upwards.	2. Fine weather expected.
OPUA (Cloud)	Full name Kāneikamakaoka`ōpua – Kāne of the `opua cloud. This cloud is seen in the morning in Kona, Hawai`i	Sign of rain (Akana & Gonzalez, 2015, p. xvii)
POI-PU (Shut up)	<ol style="list-style-type: none"> 1. Sky overcast, no wind. 2. Wind started to blow. 3. Sky had closed in with thick, heavy clouds. 4. Clouds that covered the sky were exceedingly black. 	<ol style="list-style-type: none"> 1. A state known as Poi-pu, hoo-ha-ha or hoo-lu-luhi is reached (p. 13). 2. A state known as hoo-ka-kā is reached. 3. A state known as hakuma is reached. 4. Ku-lani-ha-koi was known to be amongst them = Violent storm, thunder, lightning, torrential rain and gale force winds.
UA (Rain)	<ol style="list-style-type: none"> 1. Rain falling during a bad storm (thunder, lightning, torrential rain and gale force winds). 2. Rain unaccompanied by wind. 3. The western horizon is ablaze with at red sunset. The appearance is known as Aka-ula (Red shadow or glow). 	<ol style="list-style-type: none"> 1. Expected to move through pretty quickly (p. 13). 2. A prolonged storm experienced. 3. An indicator that the rain will stop shortly.
ULIULI (Blue-black cloud)	<ol style="list-style-type: none"> 1. Uliuli clouds seen at sunset 2. An opening formed in this cloud, like the jaw of a swordfish (au) 	<ol style="list-style-type: none"> 1. High surf expected, known also as a Pa-uli (p. 13). 2. It was called Ena, rain expected

South Kona elder Mona Kahele wrote a book called Clouds of Memories (2006) recounting her life story. Kahele provides many interesting local narratives. One relative part to this thesis is an example of a lunar calendar. Kahele explains that the rising of the new moon signals the start of the new month. She identifies 30 lunar phases and

one extra day when the points of Hoku are darker (Hoku Palemo); and the edges of the moon are not fully round before the appearance of Māhealani. It is unknown why there are gaps in the column that explains the characteristics for that specific lunar phase.

TĒPU 3.6: HAWAIIAN LUNAR CALENDAR⁹⁵

LUNAR NIGHT	LUNAR PHASE NAME	ATTRIBUTES
1.	Hilo	<i>Starting of the new moon</i>
2.	Hoaka	
3.	Kū Kahi	
4.	Kū Lua	<i>The Kapu days and nights, held strictly for ceremonial purposes</i>
5.	Kū Kolu	
6.	Kū Pau	
7.	‘Ole Kū Kahi	<i>These days are not considered good for planting or fishing (ole means no, nothing or none)</i>
8.	‘Ole Kū Lua	
9.	‘Ole Kū Kolu	
10.	‘Ole Kū Pau	
11.	Hūnā	<i>To hide or the leaves will hide the fruits</i>
12.	Mohalu	<i>Good</i>
13.	Hua	<i>For plants with fruits</i>
14.	Akua	<i>Good day</i>
15.	Hoku	<i>Good except for Hoku Palemo; fruits will not be held</i>
16.	Māhealani	<i>Good for anything; farmers and fishermen look forward to this moon</i>
17.	Kulu ⁹⁶	<i>Fruits or flowers will drop if planted on this day</i>
18.	Lā’au Kū Kahi	<i>Anything with trees are planted on this time</i>
19.	Lā’au Kū Lua	
20.	Lā’au Pau	
21.	‘Ole Kū Kahi	<i>Days of nothing; farmers rest during these days</i>
22.	‘Ole Kū Lua	
23.	‘Ole Pau	
24.	Kāloa Kū Kahi	<i>Time to plant anything with vines like ipu, pumpkin, watermelons, potatoes, or flowers on vines</i>
25.	Kāloa Kū Lua	
26.	Kāloa Pau	
27.	Kāne	<i>Night begins to get dark</i>
28.	Lono	<i>Night when you get ready to stick something in the ground</i>
29.	Mauli	<i>Darkest of all the nights; no stars</i>
30.	Muku	<i>Darkest but for half a night, then the new moon rises and stars are out</i>

⁹⁵ Kahele, 2006, pp. 251-252

⁹⁶ The author Mona Kahele listed Kulu as Kū Lua in her manuscript

In this section I have described a number of weather phenomena that are particular to Hawai'i. There are many similarities in the language, the culture and practice. In the not too distant future, I would like the opportunity to delve deeper by conducting a case study between Māori and Hawai'i. Having the opportunity to visit our Polynesian relatives on numerous occasions, I was very privileged to have formed a number of relationships with like minded, passionate Hawaiian cultural practitioners who are committed to revitalizing their ancient belief systems, traditional narratives, and deconstructing the Hawaiian worldview, the Kumulipo (Beckwith, 1981), in order to gain insights into ancestral wisdom.

Samoa

Nestled within the pito⁹⁷ of Te Moana-nui-a-Kiwa, Samoan navigators learned to triangulate their position by reading the paths of specific stars; knowing the right season to travel; knowing the right season for migratory marine and fish life; knowing how to read the weather; knowing the direction, size, and speed of ocean waves; and understanding the colours of the sea and sky, especially how clouds would gather on the summits of mountainous islands, in order to travel throughout Polynesia.

These navigators applied components of this body of knowledge while on land. Lefale (2010) wrote a seminal, peer reviewed, scientific paper entitled: *Ua 'afa le Aso Stormy weather conditions today: traditional ecological knowledge of weather and climate: The Samoan experience*, in 2008. The paper's main goal was to document and evaluate the potential role of Samoan traditional ecological knowledge (TEK) of weather and climate and how this could be integrated into contemporary western scientific methodologies of weather and climate observations, research, and assessment and response to human-induced climate change (p.318).

Lefale was a former employee of NIWA, who worked alongside my colleague and relative Darren King. He confided in us that he was inspired by the research we had undertaken with Parehauraki and Te Whānau-a-Apanui and wanted to conduct a similar investigation with his own people (P. Lefale, personal communication, March 21, 2007).

⁹⁷ Navel, centre

Unfortunately parts of the TEK he gathered were incomplete. Lefale also acknowledged that a major weakness of his research was not engaging a social scientist who spoke Samoan, knew the the local customs, and was known by the local community.

He mentioned that if he had worked with such a person, the TEK may have been forthcoming (p.311). Nonetheless, Lefale's research demonstrated that TEK was just as important as mainstream science in planning for future climate change. This research was the first of its kind conducted in the Pacific Islands and therefore provides a basis for future investigation. Tēpu 3.7 identifies a list of clouds types that also describes their physical appearance such as shapes, movement and height location and the information is mainly sourced from Lefale's (2010) informants and Teo (2011).

TĒPU 3.7: SAMOAN AND SCIENTIFIC NAMES OF CLOUDS AND THEIR MEANINGS

SAMOAN AND SCIENTIFIC NAME	CLOUD TYPE	EXPECTED WEATHER AND CLIMATE CONDITIONS	REFERENCES
Ao-lele <i>Cirrus</i>	Streak cloud, scud, flying clouds	Indicates warmer weather coming	Lefale, 2010, p. 324
<i>Cirrostratus</i>	Layer of streak cloud		Lefale, 2010, p. 324
<i>Cirrocumulus</i>	Billowy streak cloud	Indicates rain is likely later	Lefale, 2010, p. 324
<i>Alto cumulus</i>	Medium level cloud		Lefale, 2010, p. 324
Ao-fa'auliuli <i>Cumulus</i>	Heaped, dark cloud	Indicates heavy rain soon	Lefale, 2010, p. 324
Ao-fulifao <i>Stratocumulus</i>	Cross between layer and heap	Indicates a warm sunny day	Lefale, 2010, p. 324
Ao-po'a <i>Stratus</i>	Layered cloud, a large cloud	Indicates rain tomorrow	Lefale, 2010, p. 324
Ao-to'a <i>Nimbostratus</i>	Mainly layer cloud, stationary, cloudy	Probably drizzle	Lefale, 2010, p. 324

Ao-valevale <i>Cumulonimbus</i>	Mainly heaped cloud	Inauspicious, thunder and lightning threatening cloud	Lefale, 2010, p. 324
Faaulu'ulu <i>Cumulonimbus</i>	Black clouds		Te'o, 2011.
Puao <i>Mist</i>		No wind, calm	Te'o, 2011.
Selesele <i>Cumulonimbus</i>	Cumulus clouds building up	Associated with rain and squalls – stormy weather	Te'o, 2011.
Ufiata		Clouds covering the horizon at dawn	Te'o, 2011.

According to Lefale (2010), the Samoan people developed different wind names by naming each wind direction in reference to other Islands to Samoa, such as Tonga. Tēpu 3.8 identifies a list of different Samoan wind names, including any information that explains an expected weather or climatic outcome. References are mainly Lefale and Teo.

TĒPU 3.8: SAMOAN NAMES AND DESCRIPTIONS OF WIND TYPES

SAMOAN AND EUROPEAN NAME	WIND DIRECTION	EXPECTED WEATHER AND CLIMATE CONDITIONS	REFERENCES
Afa, afā <i>Storm, tropical cyclone</i>	O le afa – Wind that blows from all points of the compass. Samoan proverb: Ua āfa le aso – <i>Stormy weather conditions today.</i>	A cyclone that gathers in intensity usually starting in the north. Wind direction shifts from point to point until it has completed the circuit of the compass. When this is seen, the destruction begins. Warning to get to safety.	Lefale, 2010, p. 325; Te'o, 2011.
Agipō		Wind blowing during the night	Te'o, 2011.

Matu, matū <i>North</i>	N Northerly gale	This wind is is a precursor to many tempests	Lefale, 2010, p. 325 Te’o, 2011.
Palapu <i>Land breeze</i>	Breeze coming from the land		Te’o, 2011.
Pi’ipapa <i>Chill wind</i>		Cold wind causing people to press against cliffs	Lefale, 2010, p. 325
Siuamouli	ESE		Te’o, 2011.
Sulu	SW		Te’o, 2011.
Ti’iti’i <i>Gentle breeze</i>		Gentle, pleasant wind associated with good weather	
To’elau <i>Trade wind</i>	Northerly wind NE Trade wind	Gale force winds. Also known as Matagi To’elau. Winds blowing from the island of Tokelau, north of Samoa. Proverb: Se to’elau e ui sa ona tau fa i fale o Fiti – <i>The trade wind blows its waters into the houses of Fiji</i>	Te’o, 2011.
Tonga <i>South-South-West</i>	SSW	Bring rain and inducing drowsiness	Lefale, 2010, p. 325
Tua Upolu <i>South Easterly</i>	SE	Good weather	Lefale, 2010, p. 325;
Tuaoloa <i>South</i>	S	Black (Evil) winds. In American Samoa, folklore described Tuaoloa as the wind that will stop blowing when	Lefale, 2010, p. 325;

		the quotas of deaths are met.	
Tuāotoa	SE		Te’o, 2011.
Uafaafogaupolu	East		Te’o, 2011.
Vāinu’u	NE		Te’o, 2011.

Traditionally, Samoans predicted the arrival of extreme weather by observing changes in the environment and animal behavior in order to survive (Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.). In Tēpu 3.9, some examples of Samoan weather indicators are given, identifying the sign and the expected outcome.

TĒPU 3.9: SAMOAN WEATHER INDICATORS

NAME	INDICATOR	EXPECTED OUTCOME AND REFERENCE
ATAFA (Lesser frigatebird)	1. Atafa seen flying towards land seeking shelter. 2. Female Atafu appears during tropical cyclone.	1. A cyclone or strong winds will strike the islands soon. 2. Indicates the arrival of the eye of the storm; the worst of the cyclone is over. Reference: Lefale, 2010, p. 329; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.
GUGU (Gout)	Gout causes inflammation and pain	Rain imminent Reference: Lefale, 2010, p. 329; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.
LA’I (Westerly wind)	La’i wind strengthens in intensity becoming alot stronger	Rain and heavy squalls expected. According to the following proverbial expression, the La’i wind is seen as an omen for bad weather and thus forecasts the arrival of a storm: <i>A agi le La’i, o afa e mulia’i – If the La’i wind blows, a storm follows.</i> Reference: Lefale, 2010, p. 329; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.
MALI’O (Hermit Land Crab)	Mali’o digging up bigger holes than usual in the sand. The position of the	Indicates approaching heavy rain, storm surge or cyclone. Provides warning to

	sand signifies the wind direction.	villagers to seek higher ground and prepare for the worst. Reference: Lefale, 2010, p. 329
MATAGI (Wind)	The Winds from the back of Upolu and so as the winds from the west where the sun sets are on the way.	Cool, breezy weather conditions associated with south-easterly trade winds expected: <i>Ua oso mai foi le tua Upolu ma le La'i.</i> Reference: Lefale, 2010, p. 329; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.
MOA (Chicken)	Chickens are running for cover	Haevy rain imminent: <i>Ua tulisi'a foi moa ua lata mai le timu.</i> Reference: Lefale, 2010, p. 329
MOGAMOGA (Cockroaches)	<ol style="list-style-type: none"> 1. Unusually large number of Mogamoga seen flying or crawling around the house in the evening. 2. Mogamoga seen in Tutuila, American Samoa. 3. Mogamoga flying straight into fire. 	<ol style="list-style-type: none"> 1. Storm, cyclone imminent, fine day the next day. 2. Hot, clear skies the next day. 3. Bad or good sign depending on other factors. Approaching storm could mean death and destruction to local village or the complete opposite. Reference: Lefale, 2010, p. 329; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.
UFI (Yam)	Top branch of a yam plant falls and points towards the soil	Strong winds expected within two days Reference: Lefale, 2010, p. 326; Afoa, A., Hollister, T., Matagi, J., & Tipa, F., 2014.

The main informant, who provided Lefale with much of the localized knowledge, was a high chief from the village of Laulii in Upolu – Mr Taala Pauga, also known as the 'Weather Guru'. He was an elder who had mastered Samoan traditional weatherlore (p.320).

For the first research of its kind conducted in the Pacific, Lefale was successful in raising the profile of his own people's expertise in traditional weatherlore. The urgency that I raised at the beginning of this thesis (p.3) regarding elders who hold this type of

knowledge and who are passing away without training someone else, applies equally to Lefale's paper.

There are a number of key parts missing that could, through further investigation identify other Samoan knowledge holders to complete this research. I thought that it was ironic that a number of Lefale's informants had also gained employment working for the local Meteorological service. No doubt they would have been given an opportunity to improve their traditional skills of weather forecasting by amalgamating mainstream meteorology with Samoan weatherlore.

These examples of indigenous environmental knowledge of weather and climate more than warrants further investigation.

EARLY ETHNOGRAPHERS – COLONIAL AGENTS OF CHANGE

In the 19th and early 20th Century, Pākehā ethnographers, such as Stephenson Percy Smith, Elsdon Best, James Cowan, Edward Tregear, John White, and James Herries Beatties, were infatuated with Māori culture, ritual, songs and practice. Many made their careers by convincing Māori elders and practitioners to part with their knowledge. It was believed by most that Māori esoteric knowledge, Māori creation narratives, or knowledge associated with the whare wānanga, was only seen in publications written by Pākehā. These early ethnographers would often comment how limited Māori experts were about a particular Māori discipline, compared to themselves. Words like 'barbaric savages', 'primitive man', and 'mythology' were often used to trivialise our tūpuna's belief system. And to add insult to injury, most of their key informants were never acknowledged. Professor Smith (1999) describes how sophisticated Pākehā tools of colonisation were in marginalising mātauranga Māori:

Most of the 'traditional' disciplines are grounded in cultural world views which are either antagonistic to other belief systems or have no methodology for dealing with other knowledge systems. Underpinning all of what is taught at universities is the belief in the concept of science as the all-embracing method for gaining an understanding of the world. Some of these disciplines, however, are more heavily implicated in colonialism in that either they have derived their methods and understandings from the colonized world or they have tested their ideas in the colonies. How the colonized were governed, for example, was determined by previous experiences in other colonies by the prevailing theories about race, gender, climate and other factors generated by

'scientific' methods. Classification systems were developed specifically to cope with the mass of new knowledge generated by the discoveries of the 'new world' (p. 65).

A major criticism of these early ethnographers is that they were guilty of misappropriating MM. The misuse of Io is a case in point. Best and Percy claimed to have unlocked a hidden part of the manuscript given to them by Te Whatahoro⁹⁸; the notion of a supreme male being known as Io. The fact that Te Whatahoro was baptised into the Mormon Church brings into question its authenticity.

The misintepretation of Māori metaphors and the poor translation of Te Reo Māori into Pākehā text using a Pākehā way of thinking is yet another demonstration of how colonised MM was. Percy Smith was also responsible for influencing public opinion for many years that Māori originated in Irihia or India (Howe, 1993; Brynes, 1993). Academic scholars widely criticised Percy Smith's interpretation of his sources (Brynes, 1993).

However, the most detrimental impact to MM was how Māori female deities were ignored and effectively made invisible. Primary sources of MM that involved a very strong female narrative were silenced. Examples of the significance that key female deities played in the creation narratives have come to light through the research of the former Dean of Te Pua Wānanga o Te Ao, Aroha Yates-Smith. Her thesis, entitled *Hine, E Hine!: Rediscovering the Feminine in Maori Spirituality*, created a pathway for further research exploring Atua wāhine⁹⁹. Kirsten Gabel and Ngāhuia Murphy are two Māori researchers who have followed in Yates-Smith's footsteps by reclaiming our Atua Wāhine from the colonial darkness and made them relevant again to a whole new generation of Māori. Ani Mikaere (2017) made this cautionary comment about Best and Percy Smith:

Both Smith and Best were prolific writers on Māori traditions, and their influence in defining Māori culture has been immeasurable. An extraordinary amount of the material available to us on Māori cosmogony has been written by them or is largely based on their work. Te Awēkotuku has described the perspective of such writers as "inevitably eurocentric, and quite openly and tritely colonial". It is ironic that so many Māori now have their tikanga taught to them through the use of such material. It is also dangerous, and particularly damaging to Māori women (p. 75).

⁹⁸ The authenticity of a secret Io cult has been debated for a very long time.

⁹⁹ Female deities

Eldson Best, like his peers, reinforced the perception, common to those times, of Western superiority in all facets of intellectual discourse with Māori. Jeffrey Holman (2010) describes in depth the inequalities and the power relationship that existed between Best and Tūtakangahau, a Ngāi Tūhoe high chief and one of his main informants:

It has been observed that 'anthropology does not merely apprehend the world in which it is located, but that the colonial world determines how anthropology will apprehend it.' Colonial power structures made such anthropological contacts possible, but men like Best, as participant-observers, seldom examine the effects of the system that gave them access to men such as Tūtakangahau, under conditions of radical inequality. The investigations he undertook were 'rooted in an unequal power encounter' that gave him and his peers 'access to cultural and historical information about societies [they] progressively dominated' (p. 130).

Some of the ethnographers had little or no formal training, such as White. Holman coined them 'the self taught seekers' (2010, p. 286). Much of the criticism is focused on this fact. However, history still seems to revere these ethnographers, no matter how damaging their work has been to Māori.

James Herries Beattie was one exception, who developed a strong relationship with Ngāi Tahu. He travelled extensively throughout Te Wai Pounamu to interview and collate information from learned elders. He amassed a vast array of knowledge concerning traditional stories and narratives; fauna and flora; customs relating to all stages of life; belief; stars; and of course the weather. His life's work culminated in his book, edited by Atholl Anderson - *Traditional Lifeways of the Southern Māori*.

Tā Tipene O'Reagan states that his work has "become part of the foundation of the re-development of Ngāi Tahu culture in our generation" (Beattie & Anderson, 1994, p. 7). The key difference with Beattie, unlike his peers, was that he refrained from altering his notes.

Ani Mikaere (2011), in concluding her chapter *Cultural Invasion Continued*, had this to say:

What I hope is that you will, as indeed we all must, be prepared to question on a daily basis your own assumptions about what it is to be Māori and to reflect on the most important questions of all: from whose traditions do those assumption stem? It is only when you confront these questions that you will be able to determine whether, as you

continue the important work of guiding our young women and men to intellectual maturity, you are appropriately equipped to fulfil that role (p. 249).

In order for Māori to reclaim what they had lost, Māori needed to gain a more accurate understanding of their own knowledge base. It needed to be written by their own, and they needed to create a space for themselves to push back and debunk mainstream perceptions that only Pākehā can make sense of MM, and that Pākehā are the authority.

MĀORI AUTHORS AND PRACTITIONERS

The following are a collection of Māori authors whose writings and research cover some parts of my thesis, but not its core. As mentioned previously, I have not managed to identify any literature that has been written by Māori specifically addressing traditional Māori weatherlore. Ironically, but not surprising, when I entered these key words 'Māori weatherlore', most of the hits were either publications by Best or Percy Smith.

Wīremu Karuwhā Tāwhai (Te Whānau-ā-Rūtaia-Te Whānau-ā-Apanui)

The first Māori author I want to acknowledge is Uncle Bill, whose book, *Living by the Moon – Te Maramataka a Te Whānau-ā-Apanui* (2013), is a part of the legacy he left for his whānau, hapū and iwi. This book provides an incredible insight into the character and nature of Uncle Bill the maramataka practitioner. It is a ground-breaking exposé of maramataka that can only be applied within the rohe of Te Whānau-ā-Apanui. Even though it is a short read, it epitomizes the expression, 'He iti te kupu, he nui te kōrero', meaning that although there are only 76 pages, there is much more mātauranga that is kept within his immediate whānau. It is mātauranga in the truest sense of the word; it has to be practiced in Te Whānau-ā-Apanui. Uncle Bill did exactly what his elders had intended for him many, many years ago, when they took him and began to pass on mātauranga taiao Apanui or Te Whānau-ā-Apanui environmental knowledge of the lunar environmental calendar to him. He had 70+ years to develop and pass this body of knowledge on amongst his whānau. It has also challenged many other iwi practitioners to seek within themselves and their communities what they still retain and what they need to learn in order to recreate, revitalise or recalibrate what Uncle Bill accomplished for his iwi. In Ūpoko Tuawaru, I delve further into Uncle Bill's book to demonstrate the depth of Te Whānau-a-Apanui Maramataka knowledge he possessed.

Samuel Robinson (Kāti Irakehu – Ngāi Tahu)

Samuel Robinson (2005) is affiliated to Kāti Irakehu, a hapū of Ngāi Tahu from Banks Peninsula. He based his research on his own upbringing with his poua¹⁰⁰, who is connected by whakapapa to the renowned Ngāi Tahu tohunga, Teone Taare Tikao. It is the closest approach I have found thus far, written by a Māori author, to parts of the key components of my thesis. Essentially it is a 'how to' book for those who want to learn how Kāti Irakehu identified potential students for training, how they were prepared before entry, and how they were supported during lectures to remain focused throughout the duration of the wānanga.

Robinson provides some much-needed context, preceding the first part of the book, by posing some key questions, such as what is a tohunga? Robinson addresses an awkward question regarding the tapu nature of tohunga mātauranga being taught through a book:

In light of the fact that tohunga of the past have already revealed their ancient knowledge to people such as Sir George Grey, Elsdon Best, Herries Beattie, Edward Shortland, Pei Jones and Whatahoro Jury, Tohunga knowledge was well and truly revealed from the mid-1800s onwards, despite the precedent that said any published knowledge would become powerless and noa. Yet, it has not. Instead, without really saying so, Māori have conceived of a new formula that lies under the surface of our being, conducting the sacred powers of old into the new world. This new approach can be defined: where the old formula states that such knowledge remains powerful when people are able to receive its influence (Robinson, 2005, p. 15).

He explains the rationale for writing a book such as this. He also legitimises his right to write this book as he descends from Tom Rapatini, his great-grandfather, who was adopted by Teone Taare Tikao. Tikao is recognised as the last tohunga of his people. It was through his poua, Tom's son, that Robinson received mātauranga from a young age until the age of 15. He explains further that he was mentored by his poua and one other. I have identified all references to Tāwhirimātea. The book is separated into two parts:

Part One: Te Wānanga o Te Ao Marama – Into the World of Light

Robinson states, with a hint of caution, that the first part requires 'some attention' and is not to be taken lightly. It is comments like this that reinforce my thinking that he is

¹⁰⁰ Ngāi Tahu name for an elder or a grandfather.

genuine, as colonisation stole the deeper meanings inherent within the creation stories and the Māui pūrākau. In Chapter 8, Hine-pū-nui-o-toka is identified as the daughter of Tāwhirimātea. Mahuika marries Hine-pū-nui-o-toka and has five daughters (p.41):

- Hine-aroraki controls the gentle breezes over land
- Hine-aroaro-pari controls the southern winds and causes a sound to echo
- Hine-hauone sends out the eastern winds
- Hine-roriki controls the strong winds from the north
- Hine-rotia sends out the winds from the west

Other than the matāmua¹⁰¹, Hine-aroraki, the four daughters became goddesses of the winds. Tāwhirimātea had four sons, who were also wind deities. They all married the four younger daughters. The male wind gods became the upper winds of the heavens and the female wind goddesses became the lower winds. Each of these couples had seven tamariki, which meant 28 lesser winds were produced, so there were 32 winds upon Papa and four located in heaven. Hine-aroraki married Te Ranga, also known as Taranga. They had four sons, and the fifth son was stillborn and was thrown into the moana. Fortunately Hine-pū-nui-o-toka and her daughters were living out at sea. Hine-hauone found Māui and nursed him back to health. From then on, Māui had a special connection with Tāwhirimātea, Hine-pū-nui-o-toka and her daughters, especially Hine-hauone who saved him (pp.41-42).

Te Ranga could not decide who would marry the daughters who had been betrothed at birth to his sons. So he organised a race. Māui decided to compete against his brothers to win the hand of not one but two of the daughters. Māui captured his aunties' ohonga¹⁰², and trapped it in a sea shell. Then he placed their physical presence in a cave and covered the entrance up with rocks. If he needed any one of the winds, all he needed to do was cover up the holes that he did not want and leave uncovered the wind that he wanted to assist him. With his ingenuity, Māui managed to return with both the Red (west) and the White (eastern) sands before any of his brothers, and in so doing, won the hands of both Hine-tū-repo (Daughter of the swamp) and Hine-te-ngāhere

¹⁰¹ Eldest

¹⁰² Physical representation of the Wind goddesses

(Daughter of the forests). When people let the winds loose from the cave, violent storms issued forth. Māui kept calling them back to the cave. Māui is therefore called **Māui-mata-waru** or Māui of the eight eyes. Perhaps Māui was one of the first Tohunga Kōkōrangī? He definitely displays all the attributes of one (pp.45-48).

Part Two: Tohungatanga – The Art and Practice of the Tohunga

The Rainbow God of the Tokotauwaka: Kahukura is the rainbow atua. The rainbow represents Io-matua-kore and is also a tohu mauri. If it is seen and it is faint or vague to the eye, then your karakia will not be answered. However, if it shows clear and vibrant colours the tohu is positive, and your karakia will be answered. Two full, intact rainbows that are bright is a clear message that your kaupapa is sanctioned by the gods (p.114).

Tohungia-Poutiriao: reading weather signs and its cycles

Robinson explains that there were tohu for everything; all you had to do was pay attention:

How the waves move and how the land responds are all very important tohu when reading the weather. The clouds and the moon are observed sometimes together and sometimes individually as the tohu of the various atua come together. There are karakia or invocations to call for tohu in the winds, in the land and from the clouds. These karakia descended from our ancestor Māui-tikitiki and they were given to him from his mother Hine to keep him safe. When we look at nature, even in the sky or a stream, it is best not to take such things for granted. The weather signs are special because they teach us of the full power of the atua in their most natural form (Robinson, 2005, p. 143).

Tohu (Signs):

- A lunar halo is seen totally intact, thick and visible – rainfall is near.
- 10 stars seen within a lunar halo – rain is expected but not heavy.
- Two stars seen within a lunar halo – torrential downpour imminent.
- Double lunar halo – Gale force winds and unstable, stormy conditions expected from the direction the wind comes (p. 144).
- High clouds:
 - Signal that the weather will change in approximately 6 hours due to a distant weather system.
 - If clouds are wispy and white in patches, the weather will be fine.

- If dolphin-shaped clouds, or hook-shaped clouds upside down and arched over are seen, this means a change in the weather will occur.
 - If this phenomenon is followed by any long clouds, continuous rainfall is expected.
 - High clouds that are transparent and appear in rows like 'ripples with tears', mean a storm is headed from that direction.
 - If these clouds do not increase and are no longer continuous, the bad weather will pass in another direction, but if they increase, torrential rain will follow.
- Middle-height clouds:
 - If towering clouds are seen rising up from a common base, rain is on its way. The more clouds there are coming from the wind's direction, the heavier the rainfall.
 - Low clouds:
 - If low clouds are dense and dark, then weather will change for the worse.
 - Low, dark clouds bring less rain; higher dark clouds bring wind and rain
 - Take note of clouds getting higher or lower. If they rise the weather will improve, If they lower the weather will worsen.
 - Mountain clouds:
 - If massive towering clouds appear that have a flat surface on the bottom, bad weather is imminent, i.e. thunder, lightning, hail, and heavy rain (p. 146).

Robinson explains the responsibilities of the tohunga when extreme weather conditions were experienced. The tohunga would counter this type of weather by calling on the appropriate atua to restrain themselves. For example, if there was heavy rainfall and lightning, Ruaimoko would be told to restrain himself. If at sea and a storm blew, Tangaroa would be pacified by karakia and by blowing a pūtātara to calm him down.

However, storms could also be raised by insulting the atua. If requiring rain to fall, Kahukura (the rainbow god) would be insulted. When angered, the atua would send rain

to punish the offending people. Other methods involved the roaring sound of a pūrerehua and a rattle to cause rain to fall (pp. 165-166).

My last comments involve the section on Taumata Atua, and Whakapakoko. A taumata atua is a roughly carved stone or wood that is meant to resemble an atua, such as Tāwhirimātea, and a Whakapakoko is a carved god stick. These tools are used by the tohunga in divination, question and answers, or communicating with atua. A process to prepare oneself is explained by Robinson (pp.166-188).

Earlier on my PhD journey, when this book was launched, I asked Ngāi Tahu elders whether they thought Robinson was the real deal or not. The majority of the responses were negative. However, I am not totally convinced that all his kōrero is incorrect. Call it a gut instinct. I approached him via social media to gain a better understanding of the person. He replied to a question I posed, and the level of his response was good enough for me.

Pei Te Hurinui Jones (Ngāti Maniapoto)

Jones was a pre-eminent Tainui historian and whakapapa expert. He was born in Harataunga-Kennedy's Bay on the Coromandel Peninsula. He was brought up by his mother's grand-uncle, Te Hurinui Te Wano. His upbringing with his koroua had a profound effect on him. He gained a reputation amongst his elders as 'te tamaiti moe tohutohu nei', 'this child with significant dreams'. Te Wano took him down to the awa and conducted a ritual over his mokopuna. He never suffered from bad dreams ever again. His koroua tasked him with organising his whakapapa book that contained waiata and karakia. It was during this time that his interest in Tainui whakapapa and tikanga took hold. During his lifetime, he was a prodigious writer. His legacy is the manuscript that he painstakingly translated into English. This was a difficult task, as he followed two general principles:

1. The narrative had to read as though it was in Te Reo Māori, and
2. In order to follow the proper sequence of the whakapapa, any gaps were filled from Takitimu tribal lore.

Jones (2013a, 2013b) based most of his completed manuscript entitled, *‘He Tuhi Mārei-kura: A Treasury of Sacred Writings’*, on information that belonged to his matua whangai, Te Hurinui Te Wano. Jones is not like his Pākehā peers, Percy Smith and Best, who do not acknowledge their sources. Jones is very respectful and acknowledges all his sources, their names and their iwi affiliations. This manuscript is essentially the Tainui creation narrative that began with him investigating the Tainui creation chart. It begins with Te Kore and ends at Hoturoa.

He used the Paki-o-Matariki model that was explained to him by King Koroki’s chief speaker, Peha Wharekura. He then integrated the understandings of Te Paki o Matariki and reconstructed the Tainui creation chart. After that, he was able to follow the numerous karakia and creation accounts with better understanding. Following on from that, Jones started writing *He Tuhi Mārei-kura* while convalescing in hospital.

Jones is starkly different to most of the Pākehā ethnographers discussed previously. He doesn’t offer any of his own thoughts about the knowledge he is given. He offers this body of knowledge in its purest form, as he received it from his koroua and others. It is also obvious that Jones had been identified very early on by Waikato-Tainui and Ngāti Maniapoto, including the Kāhui ariki Kīngi Koroki, and Te Pūēā as a potential recipient and kaitiaki of sacred Tainui esoteric knowledge.

Jones’s mokopuna Ariana Paul, Tama Potaka and Dr Hēmi Whaanga were the editors of his manuscript. Jones made a significant contribution in reclaiming the Kauwaerunga o Tainui Waka. This body of knowledge contributed to the Tainui worldview in this thesis.

Professor Rangi Matamua (Ngāi Tūhoe)

Matamua comes from a long line of Tohunga. He is a graduate of Te Panekiretanga o Te Reo Māori and Te Mata Pūnenga. At present he is a Professor at the University of Waikato, based in the Faculty of Māori and Indigenous Studies. He has become an authority on Māori Astronomy, especially Matariki. He has conducted numerous presentations on Matariki, nationally and abroad, and has published a book, *‘Matariki – The Star of the Year’*.

Matamua's tipuna, Te Kokau and his son, Rāwiri Te Kokau, were Tohunga kōkōrangī – astronomers – but they were also feared as tohunga whaiwhaiā¹⁰³. Te Kokau acquired a star map from Elsdon Best in 1897, after negotiating with him to part with it in exchange for astronomical lore. Te Kokau coveted the star map that had Pākehā names of all the stars on it. He wanted to compare what he knew with the knowledge of the Pākehā. Following on from that encounter, Te Kokau decided to write what he knew about the stars and the star constellations and other astronomical phenomena. He ended up writing a manuscript. Best left after two days of interviewing Te Kokau and his son Rawiri, and published his book, *Astronomical Knowledge of the Māori*, not long after. Best's ignorance was made clear when he commented that:

The available data concerning Māori sky-lore is now exhausted, and this account must be closed. The knowledge gained by us of this subject is meagre and is unsatisfactory, but it is now too late to remedy the deficiency (Matamua, 2017, p. 4, as cited in Best, 1955, p. 64).

The importance and the relevance of this kaupapa to this thesis can not be underestimated. The ability to divine, to know how to read the signs during the heliacal rising of Matariki, and know what to look for, to know what each star within the constellation means, takes a lot of time, discipline and dedication. There is a lot of mātauranga within this body of knowledge that is associated with the weather. Matamua is quick to correct Best's translation error of Matariki; it does not mean Little Eyes. He explains the context, first regarding the Orokoitimatana o te ao or the creation narrative that concerns the separation of Rangi and Papa by Tāne (see Ūpoko Tuarua for a full explanation). The true meaning is Ngā mata o te ariki Tāwhirimātea: Tāwhirimātea is a blind god as he pulled his eyes out and crushed them in total frustration, then flung them up to Ranginui, for not besting Tūmatauenga.

Two stars are identified in particular, which are associated with the weather. These are Waipunarangi and Ururangi. Waipunarangi is connected to rain; she determines if there are rainy episodes to be experienced in the new year. Heavy, frequent showers can be expected if Waipunarangi is seen clearly during Pipiri. Ururangi represents the 'winds in the sky'; the west wind or the north-west wind. If Ururangi is clear at the same time, it will be a windier than normal year.

¹⁰³ Experts in causing physical and psychological harm by using spiritual powers.

Rāwiri Taonui, Paul Meredith and Basil Keane

‘Te Taiao Māori and the Natural World’ is a collection of stories that explore the environment using a Māori lens. I have only identified the first chapter, which is headed *Ranginui*. It covers Ranginui (the sky), Maramataka (the lunar calendar), Matariki (Māori New Year) and Tāwhirimātea (weather phenomena).

Rawiri Taonui (Ngāpuhi): He starts by introducing the creation stories from an account by Wīremu Maihi Te Rangikāheke from Te Arawa. This is followed by the acquisition of the three baskets of knowledge by Tāne at Te Toi-o-ngā-rangi, as told by Māori Marsden. Next, an explanation from Hamiora Pio from Ngāti Awa is given about Te Whānau Mārama or the family of light, such as the stars, the sun and moon. This is followed by an introduction to comets and meteors and what meaning our people attributed to these shooting stars.

Paul Meredith (Ngāti Maniapoto): Provides an explanation of how the maramataka operates. Tūtakangahau, from Ngāi Tūhoe, is identified as the source of the information that provides part of the seasonal context for this section. An example of the names of the Māori months of the year is offered. I notice that Meredith has used an example of a maramataka from Ngāti Kahungunu. My colleagues who are authorities in the Maramataka space have identified Ngāti Kahungunu as the iwi who currently have the most maramataka in their rohe compared with other iwi *‘puta noa i te motu’*¹⁰⁴. Meredith discusses a number of activities such as eeling, gardening, inanga and fishing that were reliant on the maramataka in order for one to know when was the best time for sowing, planting, harvesting, fishing, or netting.

Meredith then introduces the main tohu for new year – Te Whetū Mataho o Te Tau – Matariki. He provides a brief explanation. Unfortunately, Meredith falls into the trap when he explains what the meaning of Matariki is, saying ‘little eyes’. To his credit though, he redeems himself by including what Tāwhirimātea did in frustration after losing to Tūmataenga. Puanga is also acknowledged, as Matariki can not be seen on the west coast. It is then followed up with a number of Matariki whakataukī and Matariki

¹⁰⁴From across the country

activities. One of them mentioned is a poignant one; the remembrance of loved ones who have passed away.

Basil Keane (Ngāti Kahungunu, Rangitāne, Ngāpuhi): The last part of Ranginui's chapter is dedicated to Tāwhirimātea, the atua of winds and tempests. Keane commences by positioning Tāwhirimātea within the Creation narrative after the separation of his parents Rangi and Papa. He withdraws to be by his matua Ranginui to plot revenge. Tāwhirimātea produces numerous offspring, some of whom are identified. He explains how Tāwhiri enacts his revenge, his failure to beat Tū, and his ongoing commitment to attack Tū, which includes mankind for all eternity. The seasons are next explained; each season has a corresponding *tohu* that signals its imminent arrival¹⁰⁵. This *mātauranga* is embedded together with *whakataukī*. Next a number of significant clouds are identified, mainly those that signal either a change in the weather such as *iorangi* or those that are associated with inclement weather or violent storms or those that drop snow. Rain types are next, including a short explanation about '*ngā atua o te ua*', the rain gods *Ihorangi* and *Hinewai*. In this section, a number of weather *tohu* are listed that relate to predicting the weather, including how to read the clouds. Further explanation is provided about how our *tūpuna* viewed rain or storms to express a collective sense of mourning for a loved one. Wind types are then identified, followed by a myriad of weather phenomena such as thunder, lightning, snow, hail, frost, and mist. Keane explains how our ancestors observed these phenomena to predict the weather. The Ranginui chapter concludes with an explanation about *rua kōhā* or *rua kanapu*, meaning a death sign that involves lightning bolts striking a sacred mountain peak. A number of informants are acknowledged, such as Tuta Nihoniho (Ngāti Porou) who offers an example of a rain charm. Te Taiao Māori reflects, in a sense, MEK of weather and climate. The beauty about this book is that it encapsulates what I understand is '*te taiao*' or the environment from a Māori perspective. It involves not only *whenua*, *ngahere*, *repo*, *awa* and *moana*, but it also includes winds, clouds, rain, rainbows, thunder and lightning, hail and snow.

¹⁰⁵ Keane includes a *whakapapa*: Te Rā and Hine Raumati have a child Tāne-rore (mirage). Parearohi, the wife of Rehua also exhibits similar characteristics to Tāne-rore that is shimmering heat.

HE WHAKARĀPOPOTOTANGA - SUMMARY

The urgency that I felt at the commencement of my thesis journey to identify and organise hui with the known practitioners or elders who still retain mātauranga that is relevant to this kaupapa is still worrying me. When I read through the indigenous and Māori section, my thoughts are with our friends from around the world, who are in a similar situation to us. I think about how to encourage the next generation to feel a sense of responsibility and learn from the current generation of practitioners to ensure that this 'ancient wisdom' is not lost. The task sounds easy enough, but unfortunately it is not. And that is only one major issue. There are many more that have been highlighted, especially in the 'Early Ethnographer' section. I would like to think that we have come a long way since those times. However, it is slightly unnerving to know that Best, Percy Smith and others like them are still viewed by mainstream New Zealand, in the twenty first century, as the leading authorities on mātauranga Māori. The wero to address this lies squarely with us. We need to reclaim that space, and become the antithesis of the 'agents of change' during the ethnographers' era, by changing the mental models of the many in these times.

The next chapter is a perfect segue; the ultimate mental model for our Polynesian ancestors who dared to seek a land beyond the horizon.

Ūpoko Tuawhā: Aotearoa A New Beginning

Over the years people have always mistaken the kinds of things we do on the waka for some sort of jolly pastime...that its a kind of thing that you do to get out of doing other stuff. This isn't just coming from people who aren't Māori, or who aren't Polynesian, but who are even some of my own people, where the value of the kinds of things we do is not fully realised. So these are some of the challenges that I am asking you to all think about, because it's the ability to transform our thinking, it's probably framed and conditioned by the way we've been taught. We have to remove the kinds of things that talk about the journeys of our ancestors across the ocean. We have to remove them from the world of myth and legend and become a reality for us. Its not just fantasy! And once we get to that space then all the knowledge and traditions of our ancestors will become real. And we don't have to stand up and justify it to a bunch of scientists, or ethnographers or those kind of things because it's what we do. When we leave a shore, we don't have people saying, "Oh my god we're never going to see these people again". But they will be standing there and saying yes, we do this because that's who we are! We do this because our ancestors did this a thousand years ago. And between then and now people have told us we couldn't do it. Back now we can! And we do because we can. We can show people the kinds of things that we can do (Barclay-Kerr, 2017)

HE TĪMATANGA KŌRERO – INTRODUCTION

The rationale for including the migration narratives of the Polynesian seafaring ancestors of the Māori who sailed across the world's largest ocean, settling the most remote, isolated islands on earth, involves three key points. First it involves the unique knowledge of navigational training, of which weather and climate knowledge is a key component. Secondly it involves the speed at which these ancestors needed to adapt and adjust that knowledge and training in order to survive in a foreign land with a much cooler climate. The third key point is the lack of literature here in Aotearoa on this topic. The inclusion of these narratives is critical to demonstrate the degree of sophistication in canoe voyaging these Polynesian ancestors developed, and also to provide a pre-migration context. In short, this component of the thesis demonstrates the special character and nature these ancestors possessed in order to overcome the numerous challenges faced sailing on the open ocean for a distance of approximately 2,160 nautical miles.

Peripheral to that is the reason why there was a series of migrations during a certain period of time approximately a thousand years ago. Although it is not the focus of this thesis to explore the reasons why there was a mass exodus of waka from these islands around that time time, there is potentially one very important reason; the possibility

that a megadrought, a very extreme climatic event, was the major reason the ancestors of the Māori decided to emigrate.

In order to move forward, it is essential to look back to one's past to better understand how Māori got to where they are now, and how Māori wanted to move ahead, just as their ancestors did leaving the shores of Hawaiki, into a bright but unknown future.

POLYNESIAN LEGACY

The ancestors of the Māori are thought to have originated from a series of islands in Eastern Polynesia,¹⁰⁶ notably Tahiti (the Society Islands), Rarotonga (the Cook Islands) and Tuamotu (Howe, 2006, p. 66).

However, as a starting point for this kaupapa, these ancestors from Polynesia were in turn part of a celebrated intellectual legacy that stretches back 3,000-4,000 years; an ancient maritime race known as the Lapita people (Crawford, 1993, pp. 81-83). Much has been written about the Lapita people. They were essentially coastal fisher folk who lived along the shores of southern China. They were also renowned potters. Over time these lands became inundated by rising sea levels. Moving inland was not an option as it was too populated to the west. Their only option was to rely on their sailing and fishing skills to find a safer place to live (pp. 92-93).

Over many generations the Lapita people sustained their unique nomadic culture by developing technically advanced canoes capable of travelling thousands of kilometres across the Pacific Ocean. Not only did they develop these innovative sea-going craft; they also developed a comprehensive knowledge of navigation. They left mainland China and sailed to the east, largely upwind from their point of departure (Howe, 2006, p. 11). This ensured an easy return to the starting point on the return voyage. The rapid colonisation of the Pacific islands is a testament to the way knowledge (i.e. new routes between islands, new hazards to avoid) was shared between extended kin-groups,

¹⁰⁶ The collective Māori name that has been handed down is 'Hawaiki'. Much discussion has taken place about where Hawaiki is actually located but no one really knows. Some seem to think that it is a term for a homeland that has been left forever.

including chiefs, priests and navigators so that these people remained at the 'cutting edge' of traditional navigation.

Dr James Delgado (2015) from the Institute of Nautical Archaeology states categorically that:

If you look at maritime history and you ask who were the most successful navigators, the most successful types of ships, very few people would give you the correct answer, which is the Polynesian sea going canoe and Polynesian navigators.

Nainoa Thompson is a native Hawaiian, who was the first since the 14th century to practice the ancient art of Polynesian navigation. Trained by Mau Piailug, known more widely as "Papa Mau", the last of the traditional navigators from Satawal, Micronesia, he almost single-handedly revitalised the dying art of traditional navigation. In 1980, Thompson undertook his first voyage from Hawaii to Tahiti on Hōkūle'a. Since then he has been the lead tohunga whakaterewa¹⁰⁷ for Hawaii, sailing extensively throughout the Pacific. In 2007, he was inducted, along with four other Hawaiians, with great ceremony by Piailug, as a master navigator. Thompson (2010) provides an insight into the world of navigational training with Papa Mau:

He said, "If you want to find the first sign of a weather change, look high." He pointed to the high-level cirrus clouds. "If you see the clouds moving in the same direction as the surface winds, then nothing will change. But if you see the clouds moving in a different direction, then the surface winds might change to the direction the clouds are moving. That's only the first indication, but you don't really know yet. If clouds form lower down and are going in the same direction as the clouds up high, there is more of a chance that the winds will change in that direction. When the clouds get even lower then you know the wind direction will change." Satellite technology was in its infancy then, and many times Mau's predictions would be right and the National Weather Service would be wrong. He used the same clouds that we use to predict the weather; mare's tails, mackerel clouds. But in his world, he practices a kind of science that is a blend of observation and instinct. Mau observes the natural world all day. That's how he relates to nature. There are no distractions, so his instincts are strong (Thompson, n.d., para 10).

These ancestors discovered all the Islands of the Pacific approximately a third of the earth's surface. Piailug (2001) stated, *"If you can read the ocean you will never be lost"* (Kawaharada, 2001, p. 3). Piailug explained to Thompson that when he was asked if he could navigate Hōkūle'a from Hawai'i to Tahiti, he replied yes even though he had never

¹⁰⁷ Traditional Polynesian navigator

been there before. Part of his training involved memorising star charts that would enable him to plot a course to Tahiti.

Dr Terry Hunt (2010), an archaeologist at the University of Hawaii, acknowledges the achievements of traditional Polynesian voyagers, "...[they] were the best. We know that they reached every distant island in the Pacific, and they did it in a short amount of time".

Hoturoa Barclay-Kerr¹⁰⁸ (2017), named after the ancestral captain of the Tainui waka, was groomed from a very young age to learn everything about waka tauā, traditional Māori war canoes. Barclay-Kerr reflects about the importance of whakapapa and waka Barclay-Kerr states:

I put on here, he whakapapa because in our stories and those of you who know about our ancestor Māui, that's where his waka is. And that's the kind of place that allows me to say to people when they go: "do you believe that stuff about Māui fishing land up out of the ocean?" "Do you believe that stuff of him slowing the sun down?" And I say absolutely, why because he's my ancestor. He's not some memory from the past. He is my ancestor and the things he did then are the things we do today...The moon was just setting on Hikurangi, and the sun was rising on the other side. As we cruised along I thought this is pretty awesome. The only way you are going to see these things is on a waka. The only way you're going to see the names or the reasons our tūpuna put name places all around the coast if you go on a waka...so a waka becomes a tool of recovering all that kind of kōrero, all that kind of knowledge (Barclay-Kerr, 46.05-47.28).

He has also spent the last 30 years learning how to navigate double hulled voyaging canoes, under the guidance of Mau Piailug and other students of traditional navigation:

I call him the most famous navigator for the Polynesian people even though he's a Micronesian. That without his courage to move ahead and share what he knew with a whole bunch of us, we'd still be sitting at home thinking that people paddled canoes from one land to the next. We'd still be sitting at home thinking to ourselves that looks pretty dangerous. I'm too scared to do something like that. He's the man that taught us to have courage. He's the man who says, "Don't pray for good weather, pray for courage!" And him and my good friend Clay Bertelmann. Clay Bertelmann who taught me to just go ahead and do stuff. Don't sit around and wait for other people to do this job for you just go and do it. Even if you've got no money. Just do it. Even if you've got no waka just do it. Which is what we did. What we did, we trained a lot of people we trained lots of other people. To the point when we eventually got our own waka we had a crew of great sailors. We had a crew of great navigators and a crew of people who understood the kinds of things that challenged our ancestors that made them great. Now sometimes when you face some of these huge oceans and you see how

¹⁰⁸ Hoturoa was a keynote speaker at He Manawa Whenua Indigenous Conference .

insignificant you are as a human being in the face of an 8 or 9m breaking wave on your bow. Those are the times when you sit down and have those great conversations. You have those conversations with these guys. Now I've sit on the front of my waka, and it's the time when people say, I know we'll just leave him alone now. I sit on the front of my waka and I recall all the talk from these guys. And I recall the talk from all the stories of Kupe, of Māui all those other people. Because there is the wisdom and knowledge that will get me through this (Barclay-Kerr, 1.00.23-1.12.24).

Pailug also felt the weight of his ancestors as his sons had refused to undergo the rigorous training required to become Satawalese navigators. It was due to a request from Nainoa Thompson's people to navigate Hōkūle'a that Pailug's fame as a navigator, one of the very few traditional navigators in existence, spread throughout the Pacific. This was the catalyst, instilling a great sense of pride in the Micronesian nation; so much so that Pailug's sons did become navigators, to their father's relief and pride.

The ancient Polynesian seafarers, the descendants of the Lapita people, were able to be the best navigators in the world by establishing learning institutions like Taputapuātea. It was known first and foremost as the greatest and most sacred marae of 'Oro¹⁰⁹, located on a headland at Opoa on the windward, south-eastern side of Rai'ātea¹¹⁰ (Newbury, 1967; Crawford, 1993). Taputapuātea was also a famous navigational temple, the headquarters of the Arioi society and once considered the religious center of Eastern Polynesia (Salmond, 2006, p. 259). Navigators, warriors and scholars from throughout Te Moana-nui-ā-Kiwa would gather frequently at this place of learning to share their knowledge and experiences of deep ocean voyaging with their peers, conduct sacrificial rituals to their gods, celebrate significant religious observances and discuss the many challenges of the day.

Based on their rigorous training, the tūpuna Māui and other highly skilled tohunga whakatere waka like Kupe would, without a doubt, have noticed migratory birds such as the pipiwharau¹¹¹, the koekoeā¹¹² and the kūaka¹¹³ winging their way to Alaska from the south-west and then returning at different times of the year¹¹⁴. These were among

¹⁰⁹ Tahitian god of war, son of the great god Ta'aroa

¹¹⁰ Rai'ātea was also known as Havaiki

¹¹¹ Shining cuckoo - *Chrysococcyx lucidus*

¹¹² Long tailed cuckoo - *Urodynamis taitensis*

¹¹³ Godwit – *Limosa lapponica*

¹¹⁴ Heather, B., & Robertson, H. (2000). *Field Guide to the Birds of New Zealand*. – See more at: <http://www.nzbirds.com/birds/pipiwharauoa.html#sthash.brftYsE7.dpuf>

the many indicators that land lay in that direction. They discovered many islands of Te Moana-nui-ā-Kiwa, including the islands of Aotearoa, approximately 4000 nautical miles to the south-west keeping the bow left of the setting sun. After returning to Hawaiki, Kupe informed his peers in the whare wānanga of Hui-te-rangiora (Smith, 1913) and his own people about his adventures and the expansive, resource-rich lands of Aotearoa (Kelly, 1949). Henry (1995) gives her version of Kupe's discovery of Aotearoa once he returned home to Rai'ātea: "there is a distant land, cloud capped with plenty of moisture, and a sweet scented soil. It is situated at "Te Tiritiri-o-te-moana" ("The vast space of ocean")." Henry also describes Kupe's account in reasonable detail, giving the types of food available, and the type of the topography to expect. But the key question that everyone asked was, "what is the course the canoe should steer e Kupe?" Kupe's response was, "Let it be right to the setting sun, or the moon, or Venus. Go during Orongonui (summer) of the month of Te Tauuruora (November) when food is plentiful" (pp.169-170). Te Matorohanga (1914) retells the Kupe narrative that locates the position of Aotearoa from Hawaiki:

I mua atu o te haerenga mai o 'Tainui,' o 'Te Arawa,' me ērā atu waka katoa, ka uiui rātou ki ngā tohunga, mehemea pēwhea ngā kupu a Kupe i whakatakoto ai ki roto i te Whare-wānanga i Hui-te-rangiora i Hawaiki. Ka whakaaturia e ngā tohunga, 'Ko te kōrero a Kupe, me takoto te ihu o te waka ki Aotea-roa, mai i Ahuahu (koia te roanga atu o taua ingoa, nā ētahi iwi ko Ahu tonu). Me heke tika mai ki te tonga mai i Māui-taha, i Māui-pae. Ēnei, he mahanga ēnei motu e rua; kei waho mai o Ahuahu. Me pou tonu te ihu o te waka ki te tonga... Ka mea mai rātou, "E Kupe! Hei te pō, me takoto te ihu waka kōwhea?" Ka mea atu a Kupe, "Tukua te rā ki te taha katau o te ihu o te waka, me te marama, me Kōpū; kia taa mātonga-māuru te whakaheke o te ihu waka. (p.190-191).

Before the coming away of 'Tainui,' 'Te Arawa' and the other canoes [referred to above], the people had enquired of the tohunga [priests, learned men] as to what Kupe had laid down in the Whare-wānanga [house of learning] named Hui-te-rangiora at Hawaiki [as to the direction of New Zealand]. The tohunga replied, "Kupe's words were, in laying a course for the canoe to Aotea-roa from Ahuahu (which is the full name, though some call it Ahu), come straight to the south from Maui-taha and Maui-pae. These are twin islands outside of Ahuahu. The bows of the canoe must be directed straight to the south, and the same course leads on to Hawaiki [Tahiti]... Then said some, "O Kupe! During the night, how shall the bows of the canoe be placed?" He answered, "Leave the Sun, the Moon, and Venus on the right hand, a little south-westerly, lay the bows." (pp. 207-208).

Kupe let his mokopuna Nukutawhiti, a seasoned tohunga himself, take his waka, refit it, and reconsecrate it - Ngā-toki-matahourua.

The most promising children, grandchildren or nephews of tohunga were isolated from other children, groomed and tested to ascertain whether they had the potential to learn how to become a navigator. Even though traditional navigational institutions encouraged the sharing of any new waka innovation, the extended Polynesian tribal families tended to retain their own secrets to be passed down to their own people. These chosen few would learn about ancient navigational skills from the tohunga whakaterere waka expert, who would train them in all aspects of navigation. There were specialists for all facets of canoe voyaging, including priests who conducted karakia to ask the appropriate atua for trees to be used for canoe building, and tohunga tārai waka who identified the best tree/trees to be felled and adzed. Other specialists would be invited too to fully kit out the waka for its voyage.

Before the voyage commenced, much deliberation would take place. The navigator would pay attention to the environmental weather indicators to determine the most appropriate time to depart. They could mean inclement weather or worse; if a double halo was seen a violent storm was imminent. The navigator would also conduct karakia awa moana or rotu moana if the ocean was rough, in order to appeal to the gods to calm the waves to protect the waka and therefore ensure a safe crossing (Busby, personal communication, 2013).

The master navigator was totally responsible for three key objectives (Irwin, 2006, p. 80; Finney, 2006, p. 156):

1. Orientating, course setting and steering the waka from its commencement point to its final destination.
2. Deducing the waka's current position by using its starting point and advancing that position based upon known or estimated speeds over elapsed time.
3. Locating land.

Central to mastering these three key navigational skills was understanding the complexities of the weather to ensure a safe voyage. The dangers were well known. The waka could be swamped by huge breaking swells that could break the mast, rip the sails

or capsize the vessel during stormy weather. Traditional waka had minimal available shelter so the crew were exposed to the elements most of the time. Starvation and dehydration were also another cold, hard reality. Mistakes were often fatal. The skill of predicting the weather was therefore a critical and vital component of traditional navigation by anticipating the changing strength and direction of the wind, including the recognition of the onset of extreme weather. They could tell very quickly if there was a wind shift that the crew could use to their advantage or a cold, frontal system to be wary of (Irwin, 2006, p.82).

Tohunga Tirotiro Rangi, Tirotiro Whetū, Kōkōrangi were skilled observers of the sky, clouds and ocean swells. They learnt the seasonal wind patterns for different locations of the ocean, especially along the intended route. They knew that understanding these seasonal idiosyncrasies was extremely important to ensure that their waka had the best weather conditions for travelling in a particular direction. Daily observations involved regular checking of a number of factors including (Finney & Low, 2006, pp. 156-197):

1. Position of the rising and setting sun
2. Ocean currents and conditions,
3. Wave, swell direction
4. Gauging the wind direction using a conceptual wind compass
5. Air and water temperature
6. Air pressure
7. Colour of the sky
8. Shape, size, patterns, height, movement and colour of clouds
9. Speed of the waka; and
10. Signs of floating debris or land-based seabirds

To navigate hundreds or thousands of kilometres without satellite or radar equipment required an extensive and detailed knowledge of the ocean and the weather. The ability to predict the weather before and during sailing and knowing how to adjust was vital for a navigator voyaging on the open ocean. As the sun set, the navigator would take special interest in the colour of the sky to determine the type of weather expected the next day.

He would also be able to predict short- or long-term weather conditions depending on the type of moon phase; for example, if a crescent moon was either in an upright position or on its back, he would know what type of weather could be expected. The navigator had to memorise ocean pathways that correlated with stars that rose from known points on the horizon. If the stars or the moon were not visible navigators had to rely on the direction of the swells. The Tohunga whakatore waka used a conceptual wind compass that consisted of 32 marks encircling the waka. These marks were used to help the navigator keep on course (Finney & Low, 2006, pp 186-197).

Students needed to know all these aspects of traditional navigation, especially the spiritual components. Not only did navigators have to be competent with the physical machinations of voyaging but also they had to be a medium between themselves and their atua. To achieve this as students they underwent ritual ceremonies to be dedicated to atua such as Tāne or Tangaroa. Following this the student undertook rigorous physical, mental and spiritual training needed to ensure the correct procedures were taken and the efficacy of the karakia, when in need. The oral accounts often list the number of atua attributed to tohunga or the ariki of the waka, which strongly suggests the mana of the individual (Busby, personal communication, 2013).

After the deaths of his grandfather and father, who were both navigators, Pailug was sent to his uncle to complete his training:

An aunt and uncle adopted the boy and sent him to neighbouring Puluwat with Angora, another uncle, a highly respected navigator who continued teaching Pailug about the star bearings from one island to another, the way swells from different angles affected the canoe, what birds indicated that land was near and the other technical details and magical and spiritual lore he had to memorise and understand (Finney, 1994, pp. 170-171).

Long-distance voyaging was viewed as a very serious profession and was a high status position within the community. Mau Pailug, the last of the traditional navigators from Satawal, Micronesia, who almost single-handedly revitalised the dying art of traditional navigation, stated “If you can read the ocean you will never be lost¹¹⁵”. One of Pailug’s star pupils, Nainoa Thompson, shares some key points of traditional navigation:

¹¹⁵ Thompson, n.d., para. 8.

Sunrise is the most important part of the day. At sunrise you start to look at the shape of the ocean-the character of the sea. You memorize where the wind is coming from. The wind generates the swells. You determine the direction of the swells, and when the sun gets too high, you steer by them. And then at sunset we repeat the observations. The sun goes down you look at the shape of the waves. Did the wind change? Did the swell pattern change? At night we use the stars. We use about 220 stars by name having memorized where they come up, where they go down (Kawaharada, 2001. p.3)

Thompson recollects that the night before Pailug returned to Satawal he said, "Everything you need to see is in the ocean, but it will take 20 more years to see it." Pailug said this to him after sailing from Tahiti to Hawai'i, a return distance of 7000 miles (Kawaharada, 2001, p. 3). Although he was proud of how well Thompson conducted himself on his maiden voyage as a student navigator, Pailug as the master navigator gave Thompson some sage advice to keep ones feet firmly on the ground: "one great job does not make you a navigator. It is a lifetime profession, and through many years of experience the skill becomes intuitive".

Literally the tohunga whakaterere waka had the mana or responsibility for the life and death of his relatives. For example, if the community experienced a long drought on their island, they relied on the tohunga whakaterere waka to travel to distant islands to replenish their food and water resources and return before they starved to death (Smith, 1899).

The tuakana or eldest child of the ariki¹¹⁶ would be expected to remain on the island of his birth to eventually take up the mantle of his father. Younger siblings did not have the same constraints as their tuakana and often left their homelands to discover uninhabited islands or islands that did not have a traditional system in place (Sissons, 1989, p. 334). They left to establish their own mana, including their own settlement on an uninhabited island. Through their leadership the community lived in a sustainable, harmonious way with the environment under the strictures of mana and tapu (Irwin, 2006, p. 18).

It is not the intention to provide a complete explanation about successful navigation of double-hulled canoes on the open ocean. There are far too many aspects of traditional

¹¹⁶ Paramount Chief

Polynesian sea voyaging to discuss here. The main purpose is to provide a historical context for traditional Māori weatherlore.

TROUBLE IN PARADISE

Although the literature provides many possible reasons, nobody really knows definitively why our Polynesian tūpuna left Hawaiki, other than the threat of continued fighting. The literature strongly suggests that it had to be a life or death situation to cause them to leave their homeland forever. So what caused successive migrations of waka hourua voyaging canoes from Eastern Polynesia successfully migrate to Aotearoa? What were the right suite of skills and characteristics necessary to undertake an expedition such as this? And what skills were needed to successfully establish yourself in an unknown, potentially hostile environment? These are some of the questions that will be considered in this chapter.

Some of the most proficient tohunga, such as Ngātoroirangi, offered their services to ensure their safe journey to Aotearoa. Their navigational expertise, esoteric knowledge of the universe, intuition, wisdom, courage and more importantly their connection to Te Ira Atua made them highly sought-after (Jones & Biggs, 1995, p.32).

Historical accounts also suggest long term or megadroughts, rather than overpopulation, were the real trigger for civil warfare, causing many to migrate to other parts of the Pacific in search of new islands rich in food, and even more importantly, water resources (Irwin, 2006, p. 18).

The literature revealed an account by Lisa. M. Krieger (2014), who wrote an article for the National Geographic stating that the drought conditions experienced in the American north-west could be the beginning of a cycle of megadroughts that last for decades or even centuries, and that they are not uncommon at all:

Ancient clues in the landscape show this is not the first time the American West has been severely parched. It's unlikely to be the last. And the recent spate of dry years is nothing next to the ancient "megadroughts" that have occurred multiple times in human history. "What research shows is a roughly 50 to 90-year cycle of wet and dry periods over the last few thousand years, with some droughts lasting over a decade. But between 900 and 1400 A.D., during the 'Medieval Warm Period,' there were a

couple of droughts that were over a century long," said B. Lynn Ingram, professor of Earth and planetary science and geography at the University of California, Berkeley (Krieger, 2014, para. 5).

Krieger provides the interesting insight that during the 12th century a megadrought gripped the western seaboard of the American continent. She also describes how paleoclimatologists have conducted research using tree rings to determine past climate types to better understand what is happening now and into the future:

*But the prehistoric record, re-created by paleoclimatologists, is even more alarming - and could explain why Native Americans abandoned their settlements and began wandering. Archeological records show that Native American populations expanded in wet years, creating flourishing civilizations. Then, during periods of abnormally low precipitation, settlements collapsed. Like investigators at a crime scene, scientists are piecing together seemingly random evidence about ancient climates, deciphering clues about prehistoric droughts in sediments, tree rings, species distribution, and other natural evidence—a science known as dendrochronology...Another tree study, lead by University of Arkansas dendrochronologist David Stahle and Edward Cook of Columbia University, used more than 1,400 climate-sensitive tree-ring chronologies from multiple species across North America to reconstruct what's called "the Great Pueblo Drought," which occurred from **1276** to **1297** and may have contributed to the Anasazi tribe's abandonment of their magnificent cliff-dwellings in the northern Colorado Plateau. Other megadrought evidence can be found in forests at the bottoms of lakes and streams, using tree-ring analysis and radiocarbon dating. Graham Kent, director of the Nevada Seismological Laboratory, found a forest in the Sierra Mountains dating back to the medieval era. A drought from 850 to 1150 drained the alpine Fallen Leaf Lake, leaving it barren enough for tall trees to grow, he concluded. Then the water returned, and the trees were preserved. An 800-year-old pine branch, recently salvaged from the lake, still smells pungently of sap. Ancestral forests can also be found in recently exposed shorelines of eastern Sierra lakes and creeks. Scott Stine of California State University in East Bay tramped across an old lakebed and found dozens of ancient cottonwoods and Jeffrey pines rooted in place. Dating revealed that they grew when two severe and long-lasting droughts—from **900** to **1100**, and **1200** to **1350**—lowered the water level in the lake, then died when a return to a wetter climate filled the lake and drowned them.*

Percy Smith used a formula that was applied to known whakapapa descent lines to ascertain an approximate date that ancestral waka left Eastern Polynesia for Aotearoa. For instance, there are 26 generations from Hoturoa the captain of the Tainui waka to me. Using his model, each generation equates to 25 years; multiplied by 26 (generations) this indicates 1367 AD – a date that falls easily within the realms of possibility that Māori Polynesian ancestors experienced a similar drought (Robertson, 1956, pp. 45-54).

In isolation this reference is not compelling enough. However, I came across a recent documentary called 'Man on Earth', which documents the effects of climate change across 200,000 years of human history. The third episode, entitled "Killer Climate" explained how a Mayan city called Caracol in Belize, was once a vast, ornate stone city, fashioned without metal tools. At its height it had a population of more than 140,000. The Mayan empire was a sophisticated and rich culture that dominated Central America for a thousand years. Essentially Caracol was a desert location without stable access to drinking water. The Maya relied on rain water rather than permanent sources of water so the constant lack of water kept the Maya on the edge of survival. Webster (2002) states that "Given this precarious balance of wet and dry conditions, even a slight shift in the distribution of annual precipitation can have serious consequences" (p.239). To be able to survive in these trying conditions the Maya constructed a series of water storage facilities and the elite or royal families managed access to the water. But 1200 years ago, the climate changed, threatening to destroy their entire civilisation. Without any warning the rains stopped. Subtle variations in the flow of warm and cold water around the **Pacific** changed the patterns of monsoons in Central America, triggering a sequence of droughts that lasted more than a hundred years. Anthropologist Professor Fred Valdez from Harvard University commented that this Mayan city was a great example of how fragile civilisation can be.

The series of events that followed involved the Royal elites becoming increasingly desperate and demanding more and more sacrifices to Huracan, the Storm god. Caves located nearby contain numerous human remains that show that they were killed with a sharp instrument, strongly suggesting ceremonial sacrifice. What is known is that the common people revolted, as no rain was forthcoming to break the drought. Internecine warfare followed by famine and disease led to the total collapse of this once great city.

Climate change had exposed a weakness at the heart of one of the most advanced and confident societies of its age. Instead of adapting to climate change they tried to beat it the only way they knew how – making sacrifices to the gods. But they were unsuccessful. Any megadrought that lasted for a very long time had the ability to cause the collapse

of any society, no matter how advanced they were. Nothing lives without water (Diamond, 2005, pp. 172-177)

Perhaps this significant drought suffered in Central America extended across the Pacific and into Eastern Polynesia? Without enough water serious problems start to arise. Crawford (1993) notes that:

Repeated natural disasters and shortage of resources would prompt people to seek a better life elsewhere. It is a natural human response. The legends of islands beyond the horizon would become rosier with time and internal strife would give added momentum to the exodus. (p.113).

Experiencing an extended drought would eventually lead to internecine warfare for control over dwindling freshwater and food resources on an isolated Pacific Island in central Eastern Polynesia. The megadrought experienced on the mainland in central America lasted many decades. The chaotic collapse of the Mayan civilisation clearly demonstrates not only how important it is to have access to sufficient water, but that when the supply fails it is essential to have the courage and the ability to make the hard decisions to do something about it.

TE HARA I AWARUA - SIN AT AWARUA

An ancient Rai'ātea-Havaiki pūrākau still exists, telling how Taputapuātea was the most sacred marae in Eastern Polynesia. It had been the centre of Fa'atau Aroha (Whakatau Aroha) or 'Friendly Alliance' of collegial priests and warriors from two major factions; one from the Te Ao Uri (Dark lands – islands located windward of Rai'ātea) and Te Ao Tea (Light lands – islands located leeward of Rai'ātea). Representatives from both sections met frequently at Taputapuātea, until a Tahitian priest killed a priest from Te Ao Tea for reasons unknown, causing them to depart to the south-west, never to return. A tapu was placed upon the sacred pass of Te Avamo'a, effectively stopping all voyaging waka from entering the lagoon from that time until 1995 (Finney, 2003, pp. 317-321).

There is much literature from Aotearoa and Rarotonga that refers to a similar incident that happened at Taputapuātea-Havaiki, Rai'ātea (Finney, 2003; Henry, 1928; Smith, 1897; Sole, 2005). A common theme in the literature refers to one high priest named Ūenuku, who manages to come into conflict with a number of relatives. The closest

narrative to Finney (2003) is the pūrākau that involves Turi. Sole (2005) provides a detailed Ngāti Ruanui version of the events that involves two main protagonists: Ūenuku, the paramount ariki and head priest of Rai'ātea, and Turi, a high chief and priest of Ngāti Rongotea from Maha'ena-Tahiti, who married the daughter of Raparapa-te-ūira¹¹⁷, better known as Toto, a local chief of Awarua-Rai'ātea, named Rongorongo. Ūenuku instigates the conflict by seizing lands from Turi and his in-laws. This escalates into warfare, ending in success for Turi's faction. Ūenuku then murders Potikiroroa, the son of Turi. Turi retaliates by killing Ūenuku's son, Hawepotiki. He cooks his heart and through subterfuge, manages to insert a portion in Ūenuku's bowl of kūmara and meat. Turi was totally committed to exacting revenge against his enemy no matter what the cost. The expected attack from Ūenuku, his people and his allies never came. Fortunately for Turi, his wife overheard Ūenuku chanting a karakia makutu. She knew that the intended victims were Ngāti Rongotea and her husband. Turi knew that continued resistance was futile and that leaving Rai'ātea was the best option. Turi asked his father in-law for his help to build a waka, which he named Aotea. Ngāti Ruanui explain that in their version of the whakapapa, two waka were built, Aotea and Matawhaorua. Kupe married Toto's daughter Kuramārōtini. This event caused lasting rifts between the priesthood, ending large scale inter-island voyaging to Rai'ātea for many centuries (Sole, 2005, pp. 9-20).

Turi was not the only one Ūenuku came into conflict with. Ūenuku managed to insult and embarrass his son Ruatapu, as a person of no consequence. As a result, Ruatapu drowned all his tuakana except Kahutiaturangi, also known as Paikea, in an incident known as Huripureiata. Kahutiaturangi manages to escape by calling a humpback whale to save him. He departs Hawaiki on the back of the whale and travels to Aotearoa. From this time forward he is known as Paikea (Mahuika, 2012, pp. 2-3).

Stafford (2005) offers a Te Arawa narrative that possibly explains why the Hawaiki ancestors of Te Arawa iwi, known then as Ngāti Ohomairangi,¹¹⁸ departed Hawaiki for Aotearoa, after Houmaitawhiti's¹¹⁹ pet dog was killed by Ūenuku. In retaliation

¹¹⁷ Also known as Toto. His wife is named Pāhiwa

¹¹⁸ Also known as Ngāoho and Ohomatakamokamo

¹¹⁹ Father of Tamatekapua and Whakatūria

Tamatekapua and Whakatūria stole Ūenuku's breadfruit from his sacred tree. This escalated to all-out civil war. The subsequent attack on Houmaitawhiti's village by Ūenuku's forces nearly achieved a total rout, but Houmaitawhiti managed to rouse his sons to charge Ūenuku's army as one, completely defeating his forces. The bodies of their enemies were gathered, cooked then eaten. These events could not be left unavenged so Ngāti Ohomairangi made the decision to leave Hawaiki and migrate to Aotearoa, based on the kōrero of Kupe (Evans, 1997; Keene, 1992; Kāmira, 1957) and Ngāhue. As the high chief of the Te Arawa waka, Tamatekapua wanted only one tohunga, Ngātoro-i-rangi; who unfortunately for Tamatekapua had made a commitment to his first cousin, Hoturoa¹²⁰ to be the navigator for the Tainui waka.

However, there are also numerous other tribal pūrākau that explain why the ancestors of the Māori decided to leave their warm, tropical 'paradise' islands or atolls to immigrate south-west to Aotearoa. Over-population and political power struggles inevitably resulted in civil war and a breakdown of society (Grace 1992, p. 29; Salmond 1991; Stafford 2005, pp. 1-5; Jones & Biggs, 1995, p. 16) making it difficult for the ancestors of the Māori to continue to live under these trying conditions.

A challenge was issued by Nainoa Thompson to other oceanic nations to accompany them from Te Henua 'Enana, Marquesas, back to Hawai'i in 1995, to celebrate the original discovery and settlement of Hawai'i. Many Polynesian nations took up this exciting challenge, sailing for the Marquesas. A local school administrator from Rai'ātea, hearing that a flotilla of voyaging waka were making their way to the Marquesas, sent an invitation to all the crews to congregate at Taputapuātea before heading north to Te Henua 'Enana. The idea was to resurrect the 'Fa'atau Aroha' by addressing the wrong done to the tribes from Aotearoa (Finney, 1999, pp. 1-33)

NGĀ HEKENGĀ MAI I HAWAIKI – MIGRATION FROM HAWAIKI

E kore au e ngaro, he kakano i ruia mai i Rangiātea – I will never be lost, for the seed was sown at Rangiātea.

¹²⁰ Hoturoa's tuakana, Hotunui had recently suffered a loss of mana due to his wife's indiscretions. The leadership passed on to Hoturoa, who was a more than capable leader (R. Anderson, personal communication, 2016)

The number of waka hourua that left Polynesia for Aotearoa was significant. Being an oral culture, the fundamental role of the tohunga is to protect and provide wisdom and spiritual guidance for his people. To have so many tohunga leave Hawaiki forever suggests that serious consequences may have been experienced by those who remained behind. Neighbouring enemies may have seen this as an opportunity to attempt an invasion or an overthrow of the ariki; in this case, Ūenuku.

This phenomenon is known today as a 'brain drain', when our most capable and most educated leave Aotearoa's shores for better salaries, and possibly a better quality of life overseas. A thousand years ago it was not much different then, than it is now.

All the master navigators in Eastern Polynesia knew that for those who intended to leave for Aotearoa, the ideal time of year was October to November. Other kin-groups had either left or were about to leave for other parts of the Pacific such as Hawai'i, Marquesas, and Rapanui. Some believe that Turtle Island¹²¹ was also considered. The level of fighting between kin-groups and religious societies had reached a point of no return. The time taken to gather enough food, water and personal possessions, as well as making their waka seaworthy, created difficulties. A degree of secrecy was therefore necessary to hide preparations from their enemies so that they could depart without being stopped or attacked.

Professor Anne Salmond (1992) from Auckland University describes the challenges and obstacles that these Māori ancestors overcame to reach Aotearoa:

The 1,650 mile gap between Rarotonga and New Zealand proved to be a formidable obstacle, even for these experienced navigators, and it was not until about AD 800 that they reached this southern most Polynesian archipelago for the first time. Their long-range voyaging into Polynesia was an achievement based on sophisticated craft and navigational expertise, and it preceded the Viking oceanic explorations out of Europe by about 2,000 years. The rapid seaborne of the Austronesians is one of the great colonising movements of human history, and it is only the arrival of their Eastern Polynesian descendants that can rightly be called the 'discovery' of the land that they (or their descendants) named Aotearoa (p.24).

¹²¹ Indigenous name for North, central and South America

Before leaving Hawaiki, Nukutawhiti and Ruanui, captain of the Mamari waka, were assigned several taniwha to protect them. Nukutawhiti's waka was accorded Puhi-moana-ariki, Rangi-uru-hinga, Te Hiko-o-te-rangi and Mahere-tū-ki-te-rangi, and Te Ārai-te-uru and Niua were assigned to Ruanui's waka. Nukutawhiti then proceeded to perform an incantation to summon a great wave so that they could reach Aotearoa a lot faster. On the fourth day Puhi-moana-ariki explained to Nukutawhiti that all the taniwha had been caught in the 'net of Kahukura' and that he needed to strengthen his karakia so that they could break through it. Nukutawhiti enlisted another powerful tohunga named Paratara to do this. Their combined effort managed to enable the taniwha and the two waka to continue on their journey (Evans, 2009).

PRE-EUROPEAN AOTEAROA

"Te kete-rukuruku-a-Whakaotirangi!" – "The food basket of Whakaotirangi." (Jones & Biggs, 1995, pp. 56-57).

Aotearoa was known to be one of the last substantial islands to be colonised (Kirch, 1986). When successive migrations of the Polynesian ancestors of the Māori made landfall in Aotearoa, they arrived on the shores of a land that was unpopulated, and vastly larger than any place that had been witnessed in living memory. Their arrival coincided with the warm summer months when readily available food, like fish, kaimoana and bird life, was plentiful. However, their jubilation would have quickly turned to dismay when daily temperatures dropped considerably, to freezing conditions. Many of their precious cargoes of selected seeds and cuttings of favourite vegetables and cultivated plants (coconut, sugar cane, breadfruit, banana, pandanus, kūmara, taro, autē, tī, yams), could not thrive in the colder climate. Hence they were forced to use innovative methods to grow frost-tender seedlings.

Strict taunaha¹²² or uruuru whenua rituals were adhered to, ensuring that appropriate atua and taniwha were acknowledged for a safe passage and resident tipua or spiritual guardians were placated and acknowledged as well. Tohunga would pull hairs from their

¹²² Right of discovery; naming of unclaimed whenua

head and body, throwing them into the water to cause taniwha that had accompanied them to return to the depths of the ocean (Jones, 1995, p. 36).

As previously explained, Aotearoa is one of the most isolated countries in the world. It is a maritime country surrounded by ocean. The steep mountain ranges that run right through both Te Ika-a-Māui¹²³ and Te Wai Pounamu¹²⁴ can cause significant climate variations between the west and east coasts. Therefore, the weather was always at the forefront of people's minds in order to survive in a much harsher environment than they had been used to in the tropics. Barclay-Kerr (2017), debunks the myth, reinforced by a painting by Goldie, suggesting that a crew of Māori ancestors, obviously near death, dehydrated, and emaciated, made landfall in Aotearoa by a fluke. Barclay-Kerr explains:

So a waka becomes a tool of recovering all that kind of kōrero. All that kind of knowledge. All those kinds of things. And it returns us to all those great stories of our history. Not myth and legends but kōrero. And so this is the kind of myths we get used to. You know starving Māoris arriving to Aotearoa. You know this picture is hanging up in the Auckland Art gallery. And I've stood there in secret sometimes listening what the guides have to say about it. And often you would hear people saying, "...the journey was so hard, you can see how they are all running out of food, they were dying and all that". You know what this does it creates an image and a belief in the rest of society that this type of stuff is fraught with danger and its totally disorganised. But its not like that at all (47.23-48.34).

He showed the painting to the audience; a typical representation of how mainstream New Zealand views and values Māori traditional knowledge. Hoturoa demonstrated to us how very wrong that stereotype is in relation to the unique skills our Hawaiki seafaring ancestors had. Not only is this ancient skill of waka hourua voyaging being revitalised, his own tamariki have made countless trips throughout the Pacific, safely and without losing too much weight.

Not only was Aotearoa seemingly endless in size but the climate was cooler than the tropics. A body of new knowledge developed in response to the differing environmental conditions in Aotearoa. Very quickly they had to adapt to a new, challenging environment in order to provide warm shelter and locate sufficient food and water resources before their own meagre provisions were consumed. The application of

¹²³ North Island

¹²⁴ South Island, also known as Te Waka-o-Aoraki and Te Waka-a-Māui

proven methods of identifying new foods by trial and error rapidly increased their ability to survive. To improve their chances of survival their crew, namely their rangatira and tohunga, needed time to use their skills to do a number of things, as shown in Tepu 4.1.

TEPŪ 4.1: MAHI WHAKANOHOHONOHO PŪWHENUA HOU – ESTABLISHING A NEW SETTLEMENT

IMMEDIATE NEEDS
<ul style="list-style-type: none"> - conduct karakia uruuru whenua¹²⁵ - explore the local area and identify any hazards - identify a safe, warm location to build a shelter from inclement weather conditions - locate food resources from the moana¹²⁶ and rivers - locate a continuous supply of clean, fresh water, i.e. flowing stream or a puna¹²⁷ - locate forests to provide timber for building, to renovate their waka hourua until they could build another canoe fit for local purposes, and - clear forests to cultivate the soil for planting crops in a sheltered north facing aspect
LONG TERM NEEDS
<ul style="list-style-type: none"> - establish a tūāhu and a whare wānanga¹²⁸ - adapt and refine their knowledge of survival to local conditions - identify what is safe to eat (noa), what is not (tapu) and what is unknown (rāhui¹²⁹) - observe and recalibrate maramataka¹³⁰ - identify stars and star constellations including new ones - observe local weather and climate patterns of the rohe - identify tohu (hwarere¹³¹, āhwarangi¹³², wāhanga o te tau¹³³) - classify rain types, cloud types and wind types, especially dangerous and prevailing winds - gather observational data on seasonal changes and migration patterns of fish, bird species - study local tides - understand the life cycle of key species - disseminate historical and new knowledge to ensure continuity - provide names for flora and fauna and identify benefits

¹²⁵ Incantation to settle in a new land

¹²⁶ Ocean, sea

¹²⁷ Spring

¹²⁸ Traditional house of learning

¹²⁹ Temporary restriction

¹³⁰ Līnar calendar

¹³¹ Weather

¹³² Climate

¹³³ Seasons

It is well known that the Tainui and Te Arawa waka arrived during the summer months as the pōhutukawa was flowering at that time. Unfortunately many of the plants they brought over from the islands did not grow in this cooler climate. Hence there was a need to take special care with tubers like kūmara that did grow, to ensure they had the best growing conditions possible. Recalibrating and refining the maramataka required some urgency to better understand the local conditions that were conducive to planting, birding, fishing and eeling. The tohunga relied on this formative knowledge to provide a basis to work from, a starting point from which to begin amassing new data that was applicable to this new environment. This body of knowledge that was passed down, disseminated by word of mouth from one generation to the next, is known generally today as Mātauranga Māori. This is a relatively new concept coined to describe the collective knowledge developed over time as the tūpuna of the Māori journeyed across Te Moana-nui-ā-Kiwa from South-east Asia, populated the rest of Te Moananui-a-Kiwa to Eastern Polynesia and then refined their learnings here in Aotearoa over many centuries (Mikaere, 2011).

To ensure that these new innovations were embedded and disseminated within their hapū and iwi, tohunga and the rangatira established wānanga or learning institutions to create new tohunga with their specialist knowledge, historians, keepers of whakapapa, teachers, manual labourers, kaitiaki, and healers (Jones & Biggs, 1995). They set aside tapu areas to establish wharekura/whare wānanga to ensure the continuity and the dissemination of the esoteric instruction and training that they brought from central Eastern Polynesia. Māori have always embraced the acquisition of knowledge as a way of maintaining their mana and enhancing their quality of life (Kelly, 1949).

The teaching of essential everyday tasks was a daily activity; whānau and hapū members learnt through observation and practical experience. Learning took place while maintaining the gardens, fishing and gathering seafood, and performing other tasks essential to the welfare of the people.

The whanau and hapū were very careful and protective about sharing any new and innovative knowledge with anybody outside of their social circles. Any mātauranga was

viewed as having a certain amount of tapu or sacredness attached to it. Knowledge was not bandied about as it is today, where anybody can gain access to what was once deemed sacred knowledge. Hence, the community treated their cultural practitioners and learned tohunga with the utmost respect, especially if they were adept at specialist tasks that were deemed vital to the survival of their people (K Russell, personal communication 2016).

The acquisition of mātauranga Māori was, and still is, a gradual process of learning. Mothers and other close relatives also played an important role in training their tamariki,¹³⁴ especially those who showed an aptitude for higher learning. Children who showed potential, possessed a quick wit and were patient were identified early in life. They were placed with relatives who were specialists in their given area of expertise. These relatives would provide instruction and mentorship for the chosen few for specific roles. Students would not progress until they had mastered each level of the learning process. The proper maintenance and transmission of knowledge to succeeding generations were vital to the survival of iwi and hapū.

The sixteenth century was a time when Māori visual art expression through the media of whakairo¹³⁵, kōwhaiwhai¹³⁶, and tā moko¹³⁷ reached a high point in its development when it moved away from its distinctive Polynesian art form of straight lines and geometric arrangements and design to the unique curvilinear aspect. The rich natural resources of the environment provided a wealth of inspiration. For example, the frond of a ponga or mamaku fern became the classical symbol known as koru. The hammerhead shark is another classic example, known as the mango-pare, denoting strength in the face of adversity. No other Polynesian race has traditional art form designs like the Māori (Mead, 1984). But in regard to Māori environmental knowledge, the language is a critical component and therefore the whakapapa from Eastern Polynesia still connects us all together. Even after centuries apart and much of the 'old ways' becoming an anachronism, vestigial parts of that mātauranga grew and flourished

¹³⁴ Children

¹³⁵ Traditional Māori carving

¹³⁶ Rafter paintings within a meeting house

¹³⁷ Traditional Māori tattoo

here and still remain in the worldview of the Māori, such as pūrākau involving the demigods of Māui and Tāwhaki, and other narratives concerning Wāhioroa and Rata. Due to the location and isolation of Aotearoa, this knowledge base remained pure and unadulterated for nearly a thousand years.

WHARE WĀNANGA

The Whare Wānanga were traditional training institutions of sacred, higher learning for children of aristocratic whānau. They were the oldest learning institutions in Aotearoa, created shortly after the arrival of our Polynesian tūpuna. The main purpose of the whare wānanga was to maintain the shared learnings of previous tohunga, who had discovered knowledge, insights, creativity and innovation to benefit their whānau and hapū, and to teach a new generation of tohunga (Marsden, 1992):

The word tohunga is often translated as 'expert' (for example tohunga-tā-moko is rendered in English as 'expert carver'). Such use is wrong and stems from the mistaken idea that because the Māori used this term in association with recognized experts in a particular field the word must mean expert. The word tohunga derives from the stem 'tohu' which is a verb means a sign or manifestation. Tohunga is the gerundive of tohu and means a 'chosen one' or 'appointed one' (p. 128)

The Whāre Wānanga was not just about imparting knowledge to students, but about raising the consciousness of the individual to become 'aware'; to be able to create something new. It was therefore an establishment that focused on developing the mind of the student to master all the levels required to achieve the ultimate objective, the highest level of tohunga, Tohunga Ahurewa (Marsden, 2003b, pp. 58-59; Robinson, 2005, pp. 88-93, 272). Before students entered the whare wānanga, they were assessed by their pakeke¹³⁸ to ascertain the character and nature of each individual. Prerequisite skills were a high intellect, exceptional memory retention and quick-wittedness (Calman, 2012, p. 1).

If a child showed a certain passion or skill in a particular area or activity, such as fishing, fighting, genealogy or gardening, that child would be assigned to an uncle or aunty who excelled in that field of expertise to maximise their learning potential. The belief was that every individual had an atua developing within them, and elders focused on

¹³⁸ Adults, older generation

identifying which atua a child had, and how to manifest that atua through formal learning (Mardsen, 2003b, pp. 4-6). All forms of tuition in the whare wānanga were highly tapu or sacred. Any error or deviation could lead to being dismissed, or to death. Robinson (2005) describes in detail how Ngāi Tahu would instruct their students and some of the tools they employed to keep them on task:

Students were often tested and random questions were asked of them to see who was paying attention. Poor students who were unable to recollect the knowledge imparted were disciplined in several ways. In the first punishment the student had to place a stone in the mouth in order to keep their mind attentive while in school. The stone was later removed when it was seen the student had improved in tests given to all of them, such as the recollection of a myth with its proper place-names and family trees. No errors could be made in the whare-kura and every student had to ensure the knowledge passed on to them would not be changed in any way in future (p. 87).

Students were trained to be more observant than anybody else. It was their profession to notice any type of tohu, sign or warning and learn what the proper response was. Observation was not necessarily by sight alone. In order for the students to improve their ability to notice tohu, they were also trained to pay attention to sound, taste, touch, and smell, along with the puku or intuition. They learned to rely on their intuition over time through lived experience. Some students were born with second sight, clairvoyance or Matakite. They were able to make clearer sense of deeply spiritual observations than others, such as divination (Poroaki Heke, personal communication, 1981).

Tohunga were also responsible for marking time. They developed a huge inventory of fauna and flora indicators, often in co-relation with the stars that signalled the changing seasonal patterns and migrations of birds, whales and fish (Keane, 2010, pp. 28-29).

After the students completed their studies for the day, the same uncles and aunties reinforced the basic values around learning; it never stops, and students must always remain humble with what they have learnt.

During the early 1980's, I was taken to Te Hape near Bennydale, Mangapeehi. I accompanied a group of kūia who were healers and matakite. We met a koroua from there by the name of Tame Herangi. He welcomed us on to the whare wānanga known as Ngā Tau Hinawa-o-Miringa-Te-Kakara. I learnt how special this whare wānanga was.

It was built in the shape of cross, but without the association with Christianity. Essentially Tāwhiao charged Ngāti Rereahu to build this innovative whare wānanga based on astronomical dimensions. From the four doorways of the whare are three pou erected in line with the central potokomanawa. A key part why Miringa Te Kakara was erected, was to resist the dominant nature of Western religion and education. I also learnt about Te Rā Karepe and Rangawhenua who were former tohunga; and how they encouraged the Patupaiarehe to return to Pureora. It was here that my apprenticeship in Te Ao Wairua begun, especially in the area of healing and whakapapa.

KARAKIA

Karakia are the way our tūpuna communicated with their tuākana, the gods. Karakia were recited quite quickly and often in a high tone of voice. Correct enunciation and intonation of the karakia was essential, and as explained previously any mispronunciation or error invited calamity. Conducting karakia demanded a high price from Tohunga when asking for support from their atua. The greater the need, the higher the price (Dr Korohere Ngāpō, Personal communication, 13 June 2014). Tohunga and learned kaumātua were the most appropriate people to conduct karakia for the benefit of whānau, hapū and iwi, as they had undertaken much training (Best, 1976, pp. 310-316). Karakia were an essential part of the tool box of MEK practitioners. The following is a list of karakia associated with the weather. They are categorised into eight types¹³⁹:

Karakia kia whakaara i te hau ¹⁴⁰	-	Incantation to cause the wind to blow
- <i>Tūtakangahau</i>		
- <i>Uru-karaerae</i>		
Karakia kia whakaara i te āwhā	-	Incantation to cause a storm
- <i>Aitupawa</i>		
Karakia kia pake i te whatitiri	-	Incantation to cause lightning and thunder
- <i>Ohorangi</i> ¹⁴¹		
Karakia kia patu i te hau	-	Incantation to stop blowing-fine day
- <i>Pururangi</i>		
- <i>Tokotoko</i>		
- <i>Tūā-i-te-rangi</i>		

¹³⁹ The italicised text are different names for that particular karakia. This is by no means the only types of weather related karakia, but ones identified by research. There maybe more.

¹⁴⁰ The expression 'Ka hikaia ko te hau' was used when wind raising karakia was uttered to cause the wind to blow

¹⁴¹ Karakia conducted by tohunga to cause thunder and lightning and also the wind (Best, 1976, p. 376)

- <i>Tuatua</i>		
- <i>Tūāmuiterangi</i>		
- <i>Tupehau</i>		
- <i>Umu-puru-rangi</i>		
Karakia kia mao i te ua	-	Incantation to stop the rain
- <i>Tūā-i-te-rangi</i>		
Karakia kia waipuke i te whenua	-	Incantation to flood the land
- <i>Tuku-rangi</i>		
Karakia kia tau i te kohu	-	Incantation to cause fog
Karakia kia marino te moana	-	Incantation to calm the ocean
- <i>Awa Moana</i>		
- <i>Rotu Moana</i>		
- <i>Hika</i>		
- <i>Whakawhiro</i>		
- <i>Whakaeo</i>		

According to Elsdon Best most of the senior hapū of Ngāi Tūhoe had a tribal wind. Depending on the situation, tohunga would appeal to this 'family wind' for assistance. The Tamakaimoana hapū of Ngāi Tūhoe would raise their tribal wind known as 'Tūtakangahau' and an Urewera hapū was also known to raise their wind called 'Uru-kāraerae' (Best, 1976, p. 376). Best documented the process that his informant used in order to raise these tribal winds.

1. First, a karakia tokotoko is incanted. This is a karakia to cause the winds to move away¹⁴².
2. This is followed by uttering a karakia Umu pururangi, which is repeated to cause the winds to cease blowing.
3. Once this is completed, the ruahine starts to kohukohu or curse/insult the wind
4. A last karakia is then uttered. It is called a Karakia tuaumu-rangi

TOHUNGA KŌKŌRANGI:

The following are pūrākau of tohunga kōkōrangi who were known to have mastery over the natural elements of the weather. They understood both the physical characteristics and the spiritual aspects of the weather. This powerful knowledge was of great benefit to whānau, hapū and iwi. The lives of all the community relied on these tohunga in times of weather adversity, especially during drought or flooding. The mana that these

¹⁴² Best, 1972, p. 888. See Appendices

tohunga held was sometimes feared by their own people. Tohunga Kōkōrangi were not the kind of people you wanted as your enemy, as some of the following found out:

NGĀTORO-I-RANGI ¹⁴³

Ngātoro-i-rangi was arguably the most pre-eminent tohunga in Aotearoa, if not all Polynesia. If he had not drowned when he did, our tūpuna may have deified him. He was the son of Rakauri and Hineruarangi and was raised at Te Vaitoa in Rai'ātea. He was descended from the Ngāti Ohomairangi tribe and was the direct successor to the high priest of Taputapuātea marae at Rangiātea. He also had ancestral connections to Aitutaki, Rarotonga, Rai'ātea and other islands in the area. He was trained at Taputapuātea marae as a priest and navigator and was renowned for his skills and status. He made a number of journeys around the islands of Hawaiki and eventually rose to become a powerful high priest with the mana (authority or right) to uphold the most powerful of deities (Ikatere; Tūpai, son of Tangaroa; Te Tohi-o-te-rangi; Rongomai; Te Rākaupango & Te Rākautatawhai; & Te Aitūpawa) (Mitchell, 1972, p. 64; Grace, 1959, p. 29; Best, 1926, p. 213, Stokes, 2000, p. 15).

Shortly after leaving Rarotonga, Kearoa, the wife of Ngātoro-i-rangi, had been sexually abused by Tama-te-kapua, a well-known philanderer. So, Ngātoro-i-rangi called upon a storm to drive Te Arawa into *Te Korokoro o Te Parata* (The throat of Te Parata), a mid-ocean whirlpool. It was only when he heard the shrieks of the women and children that Ngātoro-i-rangi heart was moved with pity that he relented, and let the canoe emerge safely (Grace, 1959, pp. 43-47).

Once Te Arawa had made landfall at Whangaparāoa, Ngātoro-i-rangi travelled extensively into the interior. During one of his forays, he desired to obtain a better view of the central plateau district. After reaching the summit of Tauhara mountain, he observed his relative Tia, who had accompanied him on the Te Arawa waka, journeying to the south on the eastern shores of Lake Taupō. Fully aware that Tia was actively trying to assert his mana over the land and lake, Ngātoro commenced incantations to force

¹⁴³ Also known as Nākoloīkalani (Hāwai'i) see his whakapapa in Ūpoko Tuawhitu. Here is his Te Arawa whakapapa: Descended from Pūhaorangi, Ohomairangi, Ruamuturangi, Taunga, Atuamatua, to Rākauri his father.

him out of the district. Tia felt the full force and might of Ngātoro-i-rangi at Pākā (now known as Hamaria), causing him to return to Titirāupenga. Another Ngāti Tūwharetoa version explains that the name Taupō-nui-a-Tia is in reference to Tia's vision being obscured by the supernatural fury; the dark, billowing clouds, driving rain and the gale force winds of Ngātoro-i-rangi's mana (1959, pp. 66-67). Stokes (2000), however, states that Tia was exploring at that time too and was fully aware what Ngātoro was doing with regard to putting his mana over the land. Tia cast a great cloak of mist around himself to remain unseen from the prying eyes of Ngātoro; hence the name Taupō-nui-a-Tia came into being (p. 15).

In another incident, Ngātoro-i-rangi warned his rival, a tohunga known as Hapekituarangi (From Tainui) not to follow him up to the summit of Tongariro. But Hape ignored his warning and continued climbing. Ngātoro-i-rangi then appealed to his gods to destroy him. Dense, black clouds followed by snow and sleet were the response, resulting in Hape and his people perishing in the intense cold. This place is forever known as Rangipō, when day time turned to night. (pp. 62-64; Davis, 1990, p. 35; Hochstetter 1867, p. 391; Stokes, 2000, p. 16). Ngātoro-i-rangi threw his servant, Ngāuruhoe, into the fiery crater as a sacrifice to repay his atua for answering his karakia (Maxwell 1991, pp. 7-10; Stokes, 2000, p. 16).

Ngātoro-i-rangi on numerous occasions exhibited his abilities to manipulate the weather as a weapon of mass destruction. He demonstrated his mastery over the weather when his arch rival and brother-law, Manāia, arrived with a flotilla of waka to Ngātoro's settlement on Taumaihi-Mōtītī Island, at Matarehua Pā to destroy him.

A short time after this the people of Hawaiki, led by Manaia, arrived at Taumaihi to seek revenge for their losses. Manāia's party was very numerous, both in men and canoes. Now an old man, Ngātoro-i-rangi was residing there alone with his wife, his people being all at Maketū. Ngatoro-i-rangi called out, "Stay out there for the night, in the morning we will fight when the sun will reflect the glittering of our weapons." The host agreed to this, and cast out their anchors into the water. Ngatoro-i-rangi then hastened to his *tūāhu*, performed his incantations and divinations, and called on the winds of heaven,

named Tāwhiri-mātea, Pungawere, and Utupawa; then came the rushing sound of the howling winds called Te Aputahi-a-Pawa. The foam of the raging ocean was like sand-clouds of the desert in a gale. All were destroyed. The great host of Manahua were engulfed in the ocean, and none escaped. The destruction was called Maikukutea¹⁴⁴. Thus were the people of Hawaiki destroyed by those of this island, and the curse of Manaia avenged (Locke, 1882, pp. 435-438).

TE AOTAKI

Te Aotaki was a well-known tohunga who would use his mana to cause thunder and lightning displays over his sacred maunga Pukeāmaru for all on the Tairāwhiti to see. Te Aotaki believed that Tūwhakairiora, a famous Tairāwhiti fighting chief, was destined to gain utu for the death of his koroua Poroumata. Te Aotaki focused his karakia on Rangipopo: “E pou, e pou, e pou, whakaaraara, whakaaraara, whakaaraara; whakaaturia to mokopuna; e tangi.”¹⁴⁵ By invoking Rangipopo, Te Aotaki was stating to everyone that Tūwhakairiora was chosen by the gods. Turei names each thunderclap caused by Te Aotaki (Turei, 1911, pp. 17-34):

1. Haruru-ki-te-rangi
2. Whetuki-ki-te-rangi
3. Ueue-ki-te-rangi

TE AO-WHAINGAROA

A leading chief called Manāia had to leave the Tahitian Islands after killing Tomo-whare in single combat, on the Tokomaru waka. Manāia was relentlessly pursued by Tomo-whare’s tuakana, Nuku-tama-roto, across Te Moana-nui-a-Kiwa to Aotearoa in order to get revenge. Near Paekākāriki, Nuku-tama-roto and his war party overtook Manāia. A great sea battle took place, with many deaths on both sides. Manāia yelled out to Nuku-tama-roto to cease fighting; he then challenged him to fight him in single combat the next morning. Manāia commanded that the Tokomaru waka be dragged up on shore. During the night, **Te Ao-whaingaroa**, Manāia’s tohunga, incanted a karakia to raise the

¹⁴⁴ Ngatoroirangi gave the name Maikukutea for the his brother in law Manaia. During the evening before the battle, Ngatoroirangi offered up his prayers to his atua and they sent a storm that annihilated the taua of Manaia. The next morning all that remained of the forces of Manaia were their washed up bodies buried under the sand and their finger nails protruding through the sand at Te Akau. Literal meaning ‘white nails’.

¹⁴⁵ Turei, 1911, p. 20

Tahu-para-wera-nui wind. Shortly after, a violent storm raged, smashing the waka of Nuku-tama-roro, and killing most of his men. The storm was so ferocious that the southerly gale force winds drove gravel and sand to create the high dunes that are still there to this day along the west coast from Te Uruti at Otaki to Te Ona-puta at Paekākāriki (Smith & Te Whatahoro, 2011, pp. 132-134).

RĀ-WIRI-WAI-MAKO

The Ngāti Tūpaea-Ngāti Ruanui people who resided to the east of the Waingongoro River mouth were very envious of the fact that their Ngā Ruahine relations enjoyed exclusive rights over the fish (piharau, tuna, kokopu, pokotea) at the outlet. So they decided to do something about it. All through the night a huge work force dug a trench so that a new outlet was created, but within their boundary. When Ngāti Okahu-titi, hapū of Ngā Ruahine awoke the next morning, they were absolutely furious to see the efforts of their whanaunga. They debated throughout the day what sort of response was warranted.

Then Rā-wiri-wai-mako, the feared Ngāti Okahu-titi tohunga, strode out purposefully towards the moana. There he began his karakia, summoning the assistance of the four winds of Tāwhiri-mātea. First he called the whakarua (east wind); then the hau-raro (north wind), followed by the hau-ā-uru (west wind). But it wasn't until he called upon the tonga or south wind that a storm was finally unleashed. The hautonga slammed into the coast, causing the waves to rise higher and higher. Rā-wiri's people looked on with total amazement; the new channel had been filled in, causing the Waingongoro to flow through its old course again (Houston, 2006).

MOKE-UHI

The Puketapu hapū decided to go fishing for hapuku, which is only found at Wai-tāwhetawheta. This fishing ground is so far out to sea (10 miles) that it cannot be seen from the shore-line. The men prepared themselves, gathering their fishing gear and selecting where they were going to sit in the waka. After placing his fishing gear on his seat third one from the stern, Moke-uhi, a tohunga of note, returned to the pā after forgetting something. When he returned he found that not only had his seat been taken

but his gear had been thrown out into the surf. Totally incensed by this insult, Moke-uhi refused to rejoin the fishing party and returned to the pā. Determined on revenge he waited until all the waka had left, then he climbed a nearby hill called Mātakitaki. Here he commenced his karakia to raise a violent storm by first imploring his gods' support, first calling on the south-west wind with no result. Then he called upon the north, west and then the east to arise in storm but with no result. Then he turned to the south and such were the efficacy of his karakia that not long after a furious *tonga* appeared, blowing a gale with such force that the air around Puketapu also was affected. The waka had just completed their fishing and were about to make their way home when they met the storm that Moke-uri had raised. The wind whipped up the sea into a frenzy so that the waka became swamped and their crews began to drown. Only two survived (Smith, 1910, pp.269-271; Mitchell & Mitchell, 2004, pp. 90-91).

Houa

An interesting kōrero was explained to me regarding the history of the fall of Ngāi Tahu Kaiapoi Pā, which was known to be virtually impregnable. Although Te Rauparaha's army from Ngāti Toa, was a large one that encircled the pā, it was unsuccessful in gaining entry. Three months later, Te Rauparaha had enslaved Ngāti Kūia and Rangitāne to support his forces gaining revenge against Ngāi Tahu. One of these iwi had an exceptional tohunga karakia, and Te Rauparaha commanded him to use his abilities to find a way into the Kaiapoi Pā. Houa's special talents as a tohunga karakia with control over the elements were deployed by Te Rauparaha to assist in the destruction by fire of Kaiapoi Pā. The Ngāi Tahu tohuka had made a fatal error; he caused the brush stacked up against their pekerangi to burn, using the nor-westers to cause the fire to blow heat to harm Ngāti Toa.

When there is a northwest arch seen above the Southern Alps, locals know that a strong, blustery wind will blow across the land, but it will also swing around to the south. This is what happened in that instance; the wind swung around in Ngāti Toa's favour, causing the outer defences to catch alight. The change of wind direction was also believed to be a direct result of the efficacy of Houa karakia. Not long after, Te Rauparaha's forces

breached the outer defences of the pā, entered and gained their revenge (Mitchell & Mitchell, 2004, pp. 36, 64, 119, 121, 453).

TE HAEHAE

Part of Ngāi Tūhoe's historical accounts concerns the extra-ordinary skills of warrior priest Te Haehae, who lived at Puketapu Pā at Te Teko. One day Puketapu Pā was besieged by Ngāi Tamaoki, who initiated their strategy to gain access into the pā through setting alight a bonfire on the windward side of the pekerangi¹⁴⁶. However, Te Haehae anticipating Ngāi Tamaoki's plans, conducted a karakia whakaara i te hau to raise the 'Tūtakangahau' or the south wind, causing the smoke and fire to blow away from the pā. Not to be outdone, Ngāi Tamaoki caused a fire at the southern end of the pā. Again Te Haehae uttered another karakia, this time raising the 'Paeroa' or a north wind that blew in from the sea. No matter what Ngāi Tamaoki tried to gain entrance to the pā, Te Haehae would counter their efforts with his expert knowledge of karakia. Te Haehae is also known to have been the cause of the complete destruction of a Ngāi-te-rangi fishing fleet by raising the Uru-kāraerae wind that builds up to a violent storm (Best, 1976, p. 887).

TE KOKAU

Rangi Matamua's tipuna, Rāwiri Te Kokau, a powerful tohunga kōkōrangī, after the rising of Matariki, would climb Maungapōhatu with other tohunga to battle other neighbouring iwi, like Ngāti Hineuru located at Te Hāroto by karakia, in order to entice flocks of kereru to migrate to Ruatahuna. Rāwiri and his supporters would karakia in a sacred cave on Maungapōhatu called Te Ana Whakatangi Whaititiri meaning the 'Thundering Cave'. Rawiri's people would wait impatiently to hear the resounding thunder and lightning resounding from the cave to signal below whether they were going to have a bumper harvest of kereru, or they had a long hikoī to Te Hāroto to trade with Ngāti Hineuru for kereru (Pou Te Mara, personal communication, 15 August 2010).

These are only a few examples of Tohunga Kōkōrangī who were the masters of weather manipulation in their time.

¹⁴⁶ Palisades

HE WHAKARĀPOPOTOTANGA - SUMMARY

The Hawaiki narratives are important to this thesis as they provide a better context about the genesis of Māori environmental knowledge of weather and climate. The primary focus is on the calibre of tohunga who were chosen to navigate the ocean pathways from Hawaiki to Aotearoa, to recalibrate their own knowledge of weatherlore, and integrate it with local findings here in Aotearoa for their continued survival.

The literature clearly demonstrates that without the expertise of the tohunga whakaterewa and the tohunga kōkōrangi, the safety of this perilous journey was not guaranteed. Their expertise was invaluable in developing a new body of localised knowledge in Aotearoa, based on the maramataka, and MEK of weather and climate.

Ūpoko Tuarima: Impacts of Colonisation

“Kei muri i te awe kapara, he tangata kē; mana i te ao, he mā” – “Shadowed behind the tattooed face, a stranger stands – he who owns the earth and he is white” (Mead, & Grove, 2003, p.201).

HE TIMATANGA KŌRERO - INTRODUCTION

This chapter will examine the devastating impacts European immigrants had on Māori society by causing, directly and indirectly, an interruption to the acquisition of traditional Māori knowledge from elders and other tribal experts by supplanting it with a totally foreign, individualistic approach from England.

During the fifteenth to nineteenth centuries, Europe was engaged in a race to colonise the world. There is a plethora of literature documenting the European world powers of the day and their insatiable greed for wealth, new colonies, resources and power over their rivals. The Dutch, Spanish, Portuguese, Russian, French and British fought continually for world domination. They sailed the world's oceans to extend their nations' hegemonic dominance over the indigenous nations of the world (Salmond, 1991). Salmond describes the Dutch explorers as 'overreaching' themselves:

The archipelago that the Dutch had found, and which they later called 'Zeelandia Nova' (New Zealand), was one of the most remote places on earth. Surrounded by a vast expanse of green sea, the islands were so inaccessible that they were the last land mass of any size in the world to have been colonised by human beings. In claiming to have discovered the land, however, the Dutch over-reached themselves, for 'Zeelandia Nova' had been settled since about AD 800, when the Netherlands were still a patchwork of marshes interspersed with mediaeval towns, England was an Anglo-Saxon kingdom and Charlemagne ruled much of Europe. (Salmond, 1992 p. 24).

FIRST ENCOUNTERS BETWEEN MĀORI AND PĀKEHĀ

The first European to 'discover' Aotearoa and who is also credited with naming it New Zealand was a Dutchman named Abel Tasman, who reached the country in 1642 (Walker, 1990, p. 78). Tasman and his crew did not stay long in these waters due to a violent encounter with Ngāti Tūmatakokiri near Wainui Inlet - Te Tauihu-o-Te-Waka¹⁴⁷ leading to loss of life. Tasman then sailed north, stopping in at Three Kings Island, Fiji and Tonga, leaving forever the waters of Aotearoa (Salmond, 1991, pp. 78-84).

¹⁴⁷ Top of the South Island

The next significant arrival from Europe was Captain James Cook in 1769 (Walker, 1990, p. 78). His initial experiences with Māori were no less violent, but Cook spent a lot longer in Aotearoa's waters than Tasman. His perseverance paid off as Cook, his officers and crew circumnavigated the country, taking note of the rich, abundant natural resources in land, timber, freshwater, local fisheries, seals, and whales. Cook's observations were used in England as a rationale for future voyages (Salmond, 1991, pp. 295-296). According to Mikaere, the British had developed over many years, a 'tried and true' method of colonising indigenous peoples:

The Pacific Ocean was the last region to be colonised by these Northern Hemisphere Europeans. The British had for centuries perfected their ability to colonise another indigenous race. They knew that if you eliminate their culture, language and separate them from their land and make them dependant upon them for their continued survival, it would only be a matter of time before total assimilation is achieved (Mikaere, 2012).

These initial contacts must be seen within the contexts of both Māori and Pākehā world views. Māori saw these foreigners as patupaiarehe or goblins, who rowed their waka backwards. Their physical appearance, with white skin, red hair and blue eyes, along with their unintelligible language, reinforced the impression that Māori were observing a strange, otherworldly race of spiritual beings (Salmond, 1991, pp. 87-89). In contrast, Pākehā seamen viewed Māori in horror as wild, barbaric cannibals, tattooed from head to toe, paddling furiously, yelling at them in rough voices, gesticulating, grimacing, throwing rocks at their ship and poking their tongues. Misinterpretations underlined these initial encounters, leading in many instances to death (p. 125).

Once initial misunderstandings were sorted out and a grasp of the native language acquired, it did not take long before educated Pākehā acknowledged that the concept of advanced learning techniques was well established in Māori society. As Māori were an oral society, the tohunga had to be strict and very disciplined during instruction as powers of memory had to be prodigious (Robinson, 2005, p.85). Māori were enthusiastic about participating in any exchange of knowledge and ideas and trading goods with Pākehā. They understood very quickly that whoever controlled or possessed new technologies and species, such as muskets, steel implements and ships, potatoes and horses, might be able to gain the upper hand over their rivals. Rangatira who were

located close to Pākehā settlements maximised this advantage as much as possible (Firth, 1959, pp. 431-432).

Māori knew the value of communication. It was vital that they knew how to discuss business with the whalers, traders and also the missionaries, not only to obtain a fair price for their goods but also to ensure that they had the ear of their Pākehā friends over and above any other Māori. To guarantee that this happened many chiefs offered their daughters as wives. In the eyes of the iwi, a Pākehā who married a woman of the iwi became one of their own and enjoyed the full rights of being a member of the tribe (Derby, 2011).

The reasons for including Aotearoa as another British colonial outpost of Mother England were many. There has been much argument that if Britain had not intervened, Aotearoa's inhabitants would have exterminated each other during the musket wars of the early nineteenth century. Other imperatives involved the other European nations, particularly the French, who viewed Aotearoa as a possible French colony. Therefore, from the British perspective, Māori needed protection from themselves and from other foreign nations vying for (Asher & Naulls, 1987, pp. 10-11).

DELIBERATE INTERRUPTION OF TRADITIONAL KNOWLEDGE BASE

The arrival of European traders, whalers and immigrants from the 18th century onward had a catastrophic effect on Māori pedagogy, endangering it in many substantial ways (Royal, 2007). Even though there were many examples where Māori benefited from the introduction of Pākehā ways of thinking, new technology, radically different ways of viewing the world, religion, and the written word, these irreparably changed Māori society and culture forever. Mere Roberts explains the impact on a key component of MEK:

Following European settlement the maramataka became progressively replaced by timekeepers such as clocks and watches and a monthly calendar based on the annual movements of the sun. Accompanying its demise was the loss of knowledge and practices associated with the movements of the planets and stars, of the tides and of each moon night. Loss of land and resources including traditional horticultural crops accompanied by the drift to cities further resulted in loss of the maramataka knowledge associated with these food resources (Roberts, Weko & Clarke, 2006, p. v).

Colonisation therefore disrupted Māori concepts of time and space. Colonisation also reorganised and reclassified knowledge, especially pakiwaitara¹⁴⁸ and pūrākau to viewed as Māori myths and legends. In other words, important local knowledge made irrelevant. Pākehā turned the natural order of the Māori world upside down by viewing Te Taiao as the teina and Tangata as the tuakana. In other words, the power relationship between man and the environment changed to one of exploitation and subordination to mankind. Professor Smith (1999) reinforces this sentiment about how Pākehā came to Aotearoa with a very different way of thinking to Māori:

*For the indigenous world, Western conceptions of space, of arrangements and display, of the relationship between people and the landscape, of culture as an object of study, have meant that not only has the indigenous world view, the land and the people, have been radically transformed in the spatial image of the West. In other words, indigenous space has been **colonised**. Land for example was viewed as something to be tamed and brought under control. The landscape, the arrangement of nature, could be altered by 'Man': swamps could be drained, waterways diverted, inshore areas filled, not simply for physical survival, but for further exploitation of the environment or making it 'more pleasing' aesthetically (p. 51).*

Smith offers another example of Pākehā spatial colonisation methods when they removed the Māori place names and then renamed the whenua after places from Mother England. Smith believes that traditional indigenous knowledge systems ceased to exist once it came into contact with the West (p. 51).

When Christianity arrived in the early 19th century, offering Māori new ideas about religion, rangatira introduced their brightest students to the missionaries to learn the “three Rs” - reading, writing, and arithmetic, in order to future-proof their own way of life (Parr, 1963, pp. 211-212). By the 1830s, Māori were flocking to the mission schools to learn these new skills. The missionaries were astounded at the ability of Māori to memorise vast amounts of material, especially the tohunga and rangatira, who were well disciplined and trained in the arts of memory retention. Missionaries were responsible for denigrating our religious beliefs and therefore aiding in the lost of our spiritualism.

¹⁴⁸ Traditional narrative, story

The deliberate burnoff of ancient forests and the drainage of swamps and wetlands, irreparably changed the landscape forever. Customary places for bird snaring or eeling that had provided sustenance to whānau, hapū and iwi for many generations fell victim to the . Knowledge holders not only mourned about the loss of the natural resource, but also the inevitable loss of mātauranga and cultural practice associated with it.

It is also worth noting that Pākehā viewed the way Māori responded to their colonisation process with trepidation. George Clarke, a missionary, and chief protector of aborigines, spent some time visiting villages in Hauraki and Waikato during 1840. To his surprise, he found that nearly every village he visited had a school run by its own people, but in the medium of Māori (Calman, 2015, p. 2). I believe this mere fact would have shocked many settlers to the core, as it would have been clearly apparent that Māori as a nation, without intervention, could possibly halt settlers' deliberate tactics to colonise Aotearoa, if the Māori nation decided to unite. This, however, never eventuated. McArdell (1992) states that, "Children were taught 'correct' British values and beliefs while having their own destroyed. The oppressor was naming the world and defining how others should live in [it]" (p. 85).

TE TIRITI-O-WAITANGI – THE SACRED COVENANT

On February 6, 1840, leading colonial representatives of Queen Victoria headed by Governor Hobson met with rangatira from the northern tribes of predominately Ngāpuhi and signed what would be later known as the nation's founding document – 'The Treaty of Waitangi'. In total, 46 rangatira signed the Treaty on that day, with high expectations that it would define their relationship (Orange, 2004, p. 34). The Te Reo Māori version was signed by more than 500 of the signatories, and 39 signatories signed the Pākehā version (pp. 39-41). 12 signatories of whom were female rangatira (p.39). The Treaty almost did not happen after a negative consensus of opinion was voiced in front of the gathered British officials. However, the famous Ngāpuhi fighting chief, Tamati Waka Nene, swayed the argument in favour of signing. Despite Nene's support, he said to Governor Hobson;

"Remain for us a father, a judge, a peacemaker. You must not allow us to become slaves. You must preserve our customs, and never permit our lands to be wrested from us...Stay then, our friend, our father, our Governor"(Asher & Naulls, 1987, p. 12).

Northern Te Rarawa chieftain, Nopera Panakareao, had questioned colonial officials and the missionaries at length about the wording of the Treaty (Orange, 2004, p. 38). He wanted to be sure before signing the Treaty that he and his people were clear about what they were signing. He explained to his people using the following whakataukī that the shadow of the land would go to Queen Victoria or that Queen Victoria would have the right within Aotearoa to govern her own people, but the substance would remain with them. “Ko te atakau i riro i a te Kūini. Ko te tinana o te whenua i waiho ki ngā Māori” – *“The shadow of the land goes to the Queen, but the substance remains with us”* (p.38).

Less than eight months later the same rangatira commented that the substance of the land would pass to the Pākehā but only the shadow would remain with the Māori (Asher & Naulls, 1987, p. 13).

Prior to the signing of the treaty, a controversy arose among the representatives of the missionary churches. Bishop Pompellier¹⁴⁹ was so alarmed about the predominance of the Anglican Church associated with the British representatives leading the signing that he felt compelled to intervene (TPK, 2002, pp. 40-41). He implored Governor Hobson to add a fourth Article to the Treaty that guaranteed all the assembled chiefs that their own particular beliefs and customs would be protected. This late addition was accepted by Governor Hobson and dutifully read out as follows: “E mea ana te Kāwana ko ngā whakapono katoa o Ingarani, o ngā Wēteriana, o Rōma, me te ritenga Māori hoki e tiakine [tiakina] ngatahitia e ia”¹⁵⁰ - “The Governor says the several faiths of England, of the Wesleyans, of Rome, and also the Māori customs, shall be alike protected by him” (Law Commission, 2001, p.73).

Although this fourth article was not included in the text of the Treaty and therefore was not officially regarded as part of the formal Treaty of Waitangi package, when it was read out to the assembly of chiefs they would have taken this into real consideration in making their final decision in favour of the Treaty. Regardless of the fact that it was not officially included, this fourth article specifically spelt out to Māori in 1840 that their

¹⁴⁹ A French, Roman Catholic Bishop

¹⁵⁰ The Māori translation of the fourth Article was cited in a recent study paper by the Law Commission, *Māori Custom and Values in New Zealand Law* (2001) p 73.

customs and belief systems would be protected. Today, 176 years later, these four articles still remain a 'sacred covenant' in the hearts and minds of the descendants of the original signatories and the promises made to them (Orange, 2004, p. 32-34).

INEVITABLE CONFLICT AND ITS CONSEQUENCES

The Treaty of Waitangi held much promise for Māori, but many rangatira felt disillusioned, and had a strong feeling of being disenfranchised from trade opportunities that were never realised, causing Māori to search for a collective response to these problems (Asher & Naulls, 1987, p. 23).

In 1858 at Pūkawa on the western shores of Taupō-nui-ā-Tia, a sacred hui tōpū of high chiefs chose Potatau Te Wherowhero as the first Māori King. His office, known as the Kīngitanga¹⁵¹, was raised to protect the mana of the high chiefs of Aotearoa and to check any further land loss. Māori viewed their mana in a similar way to that in which Pākehā viewed their own British monarchy. They believed that Pākehā did not take Māori rangatiratanga¹⁵² seriously so they established the Kīngitanga in response, thinking that Pākehā would then show them more respect. However, the Colonial Government and settlers did not share the same view as Māori; in fact, they saw this as a direct threat to their perceived sovereignty of Aotearoa (pp. 24-25).

Ever since 1840, the Treaty has been a 'bone of contention' because of the confusion involved in having a Māori and Pākehā version, particularly in terms of what was perceived by the Māori signatories that they would gain and lose as a result of signing the Treaty. As it was written in both Māori and English, the Pākehā version does not match the Māori version; therefore the Treaty has been subject to wide interpretation (Walker, 1990, pp. 90-91).

Although the land was the issue that precipitated the outbreak of war between Māori and Pākehā forces, the real issue was the contest over who would ultimately control the growing multi-cultural society in Aotearoa (Asher & Naulls, 1987, p. 27).

¹⁵¹ King Movement

¹⁵² Chieftainship

Full-blown war was inevitable. Rising insecurity and discontent among rangatiratanga, chiefly related to mana, the continuous flood of humanity from overseas to chase the dream of becoming landowners, lack of respect, lack of understanding and loss of land fueled Māori thinking at that time (Asher & Naulls, 1987). The saturation of Pākehā immigrants in the Tamaki-makaurau region soon overflowed to the outlying districts. Observing food-laden waka or Māori-owned cutters stacked to the gunnels with foodstuffs to trade with the rapidly growing population, and the first-hand accounts of the traders themselves, describing the high fertility of the whenua to the south, sowed the seeds of envy and greed among the settlers, and a deep longing to obtain these lands for themselves. The new immigrants petitioned the Colonial Government, saying that they needed more land and if the government was not prepared to do anything soon they would take it upon themselves to force the issue. Settlers were looking for an excuse to legitimize moving against Māori.

- When a junior chief, Te Teira, went against the wishes of his tuakana, Wīremu Kīngi, to sell land to the Taranaki settlers it ignited a serious conflict on the west coast at Waitara and gave the settlers the excuse they were craving (Walker, 1990, pp. 114-120).

During times of war, wānanga or traditional learning institutions would go into recess until peace was achieved. Learned priests, instructors, cultural practitioners and specialists of any kind suffered just like everybody else. This period of conflict forced Māori to look towards their spiritual leaders and also their fighting warrior chiefs for guidance and protection. An extraordinary number of prophets rose to eminence too, including Papahurihia, Te Ua Haumene, Titokowaru, Te Kooti Arikirangi, Te Whiti, Tohu Kakahi, Te Tiramorehu, Te Maihāroa and Rua Kenana. These prophets' utterances were like the collective, final words spoken on behalf of all Maoridom through their gods, their ancestors, and their land against colonialism (Walker, 1990, p.129; Orange, 1994, pp. 145, 189, 199). Many cultural experts and practitioners became depressed, believing that their world had gone forever. There are many photos and paintings of Māori leaders during the late 1800s gazing at the ground in a dejected manner, looking as though they did not belong in their own country (Taylor, 1993). Many decided not to pass their skills

on to a younger generation who were perceived as not having the prerequisite skills and commitment necessary, or were generally not interested in the old ways, but more interested in the exciting new things on offer by the Pākehā. The result was that they often took their skills and knowledge to the grave (T. Pohatu, personal communication, 1981).

One of the main negative consequences of Pākehā thoughts and ideas was the notion of 'individualisation':

The change in Māori land ownership had a huge influence on Māori agriculture in the 19th and 20th centuries. The Native Lands Act 1862 was passed to individualise and register Māori land in a form that was recognisable under English common law – so that it could be readily traded. Traditional Māori land tenure was communal, carrying obligations to the wider community that were lost under individualisation. The establishment of the Native Land Court in 1865 (now known as the Māori Land Court) and the introduction of numerous pieces of legislation over the following 50 years, saw vast tracts of Māori land move out of Māori control (Kingi, 2008, p. 2).

This was a foreign concept to Māori at first, but as Pākehā religion and idealism started to infiltrate their daily lives it became a very effective tool with which to undermine the fabric of Māori society, by questioning the validity of living in a communal way. The notion of exclusive ownership of anything by an individual was very foreign indeed to Māori. The concepts of utu, tapu and noa, and even the idea of rangatiratanga were brought into question by Pākehā. Many iwi at that time had slaves and this type of discussion found an attentive audience, who embraced what Pākehā were espousing as a way of emancipation. In effect, the Government actively promoted that the Pakeha way of life was the way of the future. Following the traumatic wars of the 1860s, Māori had had enough of fighting and were resigned to the fact that if they did not do something soon they would remain a beaten people in their own country. A hard edge was felt from that time onwards by Māori during the post-war environment in dealing with the Colonial Government. A marked shift in the education policy effectively closed down the missionary schools and led the way for the establishment of Native Schools. Rather than enable missionary schools to be rebuilt, the Government provided state-owned Native Schools that ironically were requested by Māori themselves (Walker, 1990, pp. 146-147). The Colonial Settler Government assumed full authority and control of Aotearoa without recognising the negotiated partnership alluded to in the Treaty, thus depriving Māori of their right to self-determination. Māori were also denied the

right to an education equal to that of Pākehā. Basically, separatist policies were enforced allowing Pākehā children the best education available, while Māori were provided education that did not allow for higher learning aspirations. Pākehā required cheap labour to run their new country. The Native Schools Act of 1867 saw numerous Māori communities gifting lands for these new types of schools to be built. These communities had high expectations that these State schools would be the vehicle for educating their tamariki so that they could lead and ensure the continued survival of their own whānau and hapū into the future. Therefore they did not mind that Te Reo Pākehā would be the medium of instruction. However, the loss of Te Reo Māori in favour of Te Reo Pākehā had serious long term repercussions that contributed to loss of culture and the production of generations of Māori unschooled in their own ways (Calman, 2012, p. 3). There are many narratives, including that of the my father, that if you were caught speaking Māori on the school grounds you were punished with the cane or a leather strap. These children would more often than not suffer another punishment when they got home once their parents heard about their misdemeanour. Regular inspections from the Native Affairs Department ensured that a rigorous, disciplined regime was enforced by the teachers as agents of change. Kaumātua began to worry about how to prevent their own social norms, customs, beliefs, and traditions from disappearing. The musket wars of the early 1820s and the Aotearoa Wars in the 1860s, coupled with introduced European diseases, low morale, stress, deprivation and starvation experienced by Māori led to a rapid decline in population. The decline was so severe that by the end of the nineteenth century many people predicted the imminent extinction of the Māori race (Asher & Naulls, 1987, pp. 32-33). In 1999, Dr. Judith Simon gave evidence to the Waitangi Tribunal on behalf of her claimants, describing the traumatic effects the assimilation policies had on Māori tamariki. To illustrate her point, Simon cited Hugh Carleton, who summed up the general feelings of the Settler Government during that time, *'things had now come to pass that it was necessary either to exterminate the Natives or to civilise them'*¹⁵³. Dr Simon's damning exposé goes on to say that:

"the structure of the native schools system served to promote Pakeha knowledge as more important and valid than Maori knowledge. She believed that Maori cultural values and institutions were both consciously and unconsciously denigrated, while

¹⁵³ Waitangi Tribunal Report. (n.d). *The Wānanga Capital Establishment Report: Chapter 2 – Māori Education in New Zealand: A Historical Overview*. Retrieved from https://forms.justice.govt.nz/search/Documents/WT/WT_DOC_68595986/Wai718.pdf

Pakeha-dominant class ideas and values were promoted. Central to the native schools' philosophy was the limitation of the curriculum, designed to restrict Maori to working-class employment."

Efforts to buck this trend culminated in the establishment of the Anglican Boarding Schools for Māori during the late nineteenth century, including Hato Tipene (St Stephens), Hato Petera (St Peters), Te Aute, Hato Paora, Turakina, and Hato Hohepa. Many Māori leaders attended these prestigious colleges, including Sir Apirana Ngata, Sir Te Rangihiroa (Peter Buck), Sir James Carroll, Sir Māui Pomare and Dr Tūtere Wīrepa, who became the first group of Māori to gain university degrees. Whānau and hapū supported their most gifted tamariki to enter these boarding schools in an effort to succeed at the highest level. Following on from the successes of the Te Aute Young Māori Party, a Royal Commission was conducted to identify the reasons why this happened and to eradicate any thought of higher learning and to promote the 'dignity of manual labour', much to the disgust of Māori (Walker, 1990, pp. 177-181).

THE TOHUNGA SUPPRESSION ACT

Arguably the most significant tool as an agent of change used to subordinate mātauranga Māori was the 1907 Tohunga Suppression Act. It was enacted to stop tohunga, Māori healers and others from practicing traditional rituals, ceremonies or practice (New Zealand, 1907). What is ironic, one of Māori academic giants, Sir Māui Pomare lead the introduction of this Bill to:

Act to suppress Tohungas. Whereas designing persons, commonly known as tohungas, practise on the superstition and credulity of the Māori people by pretending to possess supernatural powers in the treatment and cure of diseases, the foretelling of future events, and otherwise, and thereby induce the Maoris to neglect their proper occupations and gather into meetings where their substance is consumed and their minds unsettled, to the injury of themselves and to the evil example of the Maori people..(Waitangi Tribunal, 2011, p. 614).

The ramifications of this bill cannot be underestimated. It caused many practising tohunga to go 'underground'. Professor Mason Durie (2005) had these strong views about the effects of the Tohunga Suppression Act that:

"the Act outlawed '[t]raditional healers and political leaders' and, by extension, 'opposed Māori methodologies and the legitimacy of Māori knowledge in respect to healing, the environment, the arts, and the links between the spiritual and the secular – te kauae runga and te kauae raro" (p. 200).

There are many other leading Māori scholars who argue that this Bill was, “hugely damaging to Māori culture” (Waitangi Tribunal, 2011, p. 624). The effects of this act in my opinion interrupted centuries of careful observation, lifetime connectedness with the local environment and any dissemination of MEK to the next generation in order for this unique body of localised knowledge to survive. One personal observation I make is the lack of matakite healers that are operating today. I grew up knowing many practitioners in my youth, but sadly today the ones I knew have passed on and most importantly I do not see any others coming to replace those who have gone.

HE WHAKARĀPOPOTOTANGA - SUMMARY

Māori are still experiencing a ‘hang over’ from colonisation. New Zealand was one of many colonies of the British Commonwealth that experienced the full weight of the colonising processes applied to assimilate the iwi of Aotearoa and drag them into the nineteenth century. The catastrophic, traumatic effects of colonisation on Māori society coupled with the Tohunga Suppression Act, had an irreparable impact on the ability of Māori to pass on to their children ancient, localised knowledge to ensure continuity and accuracy. Māori noticed with dismay the exploitative nature of the Pākehā, which was also part of the colonisation process, is also what destroyed the foundation of our mātauranga base. With the loss of language, culture, belief systems, practice, tribal lands, intact ecosystems, good health, and proven leadership; Māori society was seriously teetering on the brink of extinction. Māori leaders started to rally by identifying the brightest tamariki, like Apirana Ngata, Buck, Carroll and Pomare to fight back, just like Tūmataunga did against Tāwhiri-mātea; to push back against oppression and racism, to create a space for themselves so that Māori could dare to hope and to live and to do things their way they wanted to. Even though the Royal Commission tried to stop any further educational successes coming out of Māori Boarding Schools like Hato Tipene¹⁵⁴, the demand from tribal leaders for excellent Māori schools to continue teaching their tamariki was, for now, here to stay.

¹⁵⁴ St Stephens located at Bombay, South Auckland.

Ūpoko Tuaono: Mātauranga Taiao Māori – Māori Environmental Knowledge (MEK) of Weather and Climate

HE TIMATANGA KŌRERO - INTRODUCTION

Ūpoko Tuaono explores what is Mātauranga Māori (MM). It also introduces MEK and then presents the conceptual framework I created to identify the key elements of MEK of weather and climate.

WHAT IS MĀTAURANGA MĀORI

Simply put, Mātauranga Māori (MM) is the body of knowledge originating from Māori ancestors, including the Māori worldview, Māori creativity and cultural practices. MM began when our Polynesian ancestors arrived in Aotearoa, and continues to the current generation. Although MM is viewed as a contemporary expression and was not a part of the common Māori knowledge vernacular thirty or more years ago, currently it is well embedded in the consciousness of not only Māori but also most academic researchers throughout the country. The Vision Mātauranga (VM) policy, created by Charles Te Ahukaramu Royal, with the purpose of unlocking the innovation potential of MM resources and people, has helped tremendously to entrench MM in contestable funding rounds for mainstream science (MoRST, 2007). The current National Science Challenge has an MM component associated with each stream, to ensure that it addresses MM-based research to further the research aspirations of Māori. Wiri (2001) provides a broad definition of Mātauranga Māori:

Māori epistemology: the Māori way; the Māori worldview; the Māori style of thought; Māori ideology; Māori knowledge base; Māori perspective; to understand or to be acquainted with the Māori world; to be knowledgeable in things Māori; to be a graduate of the Māori schools of learning; Māori tradition and history; Māori experience of history; Māori enlightenment; Māori scholarship; Māori intellectual tradition (2001, p. 25).

Professor Rangi Matamua (2018) had a deeper understanding what Mātauranga Māori meant to him:

I ahu mai i te mātauranga Māori i a Rehua i ngā rangi. Nā, ka piki a Tāne ki ngā rangitūhāhā, ki te tihi o Manono, ki te wāhi i noho ai a Rehua. Ana, ka pātai atu ki a Rehua, anā, ki ētahi ko Io, ki ētahi atu ko Rupe. Engari i roto i a mātau ko Rehua, ā, ko ngā kete o te mātauranga. Ko ngā kōrero a Rehua ki a Tāne, “Ana ko te mātauranga kei au, nō te kou o taku mahunga. Ana ko te kou o taku tikitiki. Ana ka hoatu ki a koe,

kia heke koe ki raro rā ki te whenua, kia mōhio mai koe ki tēnei mea te mātauranga, he wai nō Ruawhetū...Nō reira, ko te mātauranga Māori, ka tūhono tātau te Māori ki ngā atua, ki tō tātau taiao. Koirā te rerekē ki au, te mātauranga Māori me te mātauranga o ētahi atu o nāianeī (R. Matamua, personal communication, 9 January 2018).

Although MM is a contemporary expression, it has a definite whakapapa; as Professor Matamua stated, the genesis of MM began when Tāne asked Rehua for Ngā Kete o te mātauranga. Ngā Kete o te mātauranga is what connects us, humankind, to ngā atua and therefore to the natural environment. Essentially that is what differs with knowledge of others.

WHAT IS MĀORI ENVIRONMENTAL KNOWLEDGE OF WEATHER AND CLIMATE?

Māori environmental knowledge (MEK) or Mātauranga Taiao Māori was coined by a colleague and whanaunga of mine, Dr Darren King. King (2007) defined MEK as a:

Cumulative body of knowledge, practice and belief that has evolved through an adaptive processes. This knowledge is not just “traditional” but also contemporary, representing the totality of experiences of generations of Māori in New Zealand. Information and knowledge includes observing and recording changes in the physical environment, naming and classifying areas of risk, and predicting environmental disturbances (p. 60).

King viewed MEK as a subset of MM that involves the sum total of how Māori interacted, learnt, observed, applied and developed their place on the whenua and how they protected themselves from the challenges associated with the weather (King & Goff, 2006, p. 2; King & Skipper, 2006, p. 22-23; King, Penny, & Severne, 2010, pp.103, 110). Over the centuries, Māori developed a deep knowledge base about their local environment, with the lessons learnt incorporated into traditional and modern practices such as mutton-birding, agriculture, fishing, medicine, education and conservation. Therefore MEK of Weather and Climate is a localised body of knowledge that is founded upon peoples' observations of the weather, what they believe are the causes of the weather and more generally speaking, the place of weather in the belief system of an iwi.

Why is it important and what can it teach us?

MEK of weather and climate was invaluable to Māori communities. It is a body of localised knowledge that has taken many hundreds of years of careful observation and experimentation to ensure accuracy; to develop into a way of life. This way of life can allow a deeper understanding, and a strong sense of connectedness to place.

WHAT ARE THE KEY ELEMENTS THAT CONSTITUTE MEK OF WEATHER AND CLIMATE?

Analysis of the key themes from the interview transcripts and the literature revealed eight principal strands of knowledge. These strands represent the most important parts of a conceptual framework that I developed to help me better understand what constitutes local MEK of weather and climate, including what skills were necessary to enable iwi such as Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu to predict the weather with reasonable accuracy. With each strand I have provided context to explain why it has been identified within this conceptual framework.

KO NGĀ WHENU-TAPU-E-WARU – EIGHT PRINCIPAL STRANDS OF MEK

The Ngā Whenu-Tapu-e-Waru (NWTW) identified are as follows:

1. Aronga-ā-iwi - Worldview
2. Te Ao Wairua – Spiritual World
3. Ngā Maumaharatanga - Mnemonic or Memory Techniques
4. Ngā Whakarōpūtanga - Nomenclature & classification
5. Ngā Tohu Matapae Huarere, Āhuarangi me te Wāhanga-o-te-tau - Environmental Indicators of Weather, Climate & Seasonal Prediction
6. Tirohanga Whānui - Longitudinal Observations
7. Akoranga - Specialised Training
8. Whakaritenga me ngā Taputapu - Application and Tools

1. ARONGA-Ā-IWI – WORLDVIEW

What is a Māori worldview? Each tribal area has its own particular way of viewing the world. The term 'Māori worldview' was coined to describe how Māori, in particular, understood their personal relationship with the environment they lived in, and the effect the topography had on all aspects of their life. It is the sum total of their beliefs;

the mental model of the world in which they live. The Māori worldview does not just shape Māori reality, it is our reality (Pohatu, 2003, pp. 1-15).

Associate Professor Angquyaq Oscar Kawagley was a Yupiag indigenous educator, anthropologist, actor and philosopher who taught at the University of Alaska. As he was brought up in the traditional ways of his people by his grandmother, he had a clear understanding what a Yupiag worldview consisted of:

Three corners of a base to represent the human being, nature, and spirituality respectively as elements in a common circle of life, we can see the apex as representing the worldview that overarches and unites the base elements of our existence. The lines connecting these "poles" can be seen as the life forces that flow all ways between and among the human, spiritual and natural worlds and are united through the worldview. These three base poles all provide essential supports to be the Yupiag worldview (Kawagley, 2006, p. 14).

Marsden (2003b) states that there is no 'one' Māori worldview, as each iwi differs:

The worldview is the central systemisation of conceptions of reality to which members of its culture assent and from which stems their value system. The worldview lies at the very heart of the culture, touching and strongly influencing every aspect of the culture (p.56).

Marsden (2003b) suggests that 'the Māori had a three-world view, of potential being symbolised by Te Korekore, the world of becoming portrayed by Te Pō, and the world of being, Te Ao Mārama' (p. 20).

The word 'kore' means 'not, negative, nothing'. When the root of a word is doubled in Māori, it intensifies its meaning. [...] How is it possible to intensify that which is already absolute? By means of a thorough-going negativity, that which is negative proceeds beyond its limits and assumes the characteristics of the positive. [...] Thus, Te Korekore is the realm between non-being and being: that is, the realm of potential being. (Marsden, 2003b, p. 20).

One possible way of grasping this process is to compare it with the cultivation of a seed. The seed (*Te Korekore*) contains the potential of a full-grown plant or tree; the process of cultivation (*Te Pō*) is what brings out the potential, and the result of a successful process of cultivation is the coming into existence of the plant or tree (*Te Ao Mārama*). This three-fold process of creation can be linked to the three stages of the devising process, whereby the point of departure is the potential or the seed, the devising process is the becoming or the process of cultivation, and the performance is the world of being or the fruition. According to Marsden (1988, p. 9), "Māori perceived the

universe as a 'process', comprised of a series of interconnected realms from Te Kore separated by aeons of time from which there eventually emerged the natural world". This process was unified and bound together by spirit – connecting Māori with their ancestors: Papatūānuku¹⁵⁵ and Ranginui¹⁵⁶ (Tunks, 1997).

The way Māori view the world is also expressed through song, dance, tribal practices and histories concerning their understanding of how the world was created. This is the reason why, no matter what part of Aotearoa they are from, the local environment shapes and forms their perception of how they view the world. It identifies who they are and where they are from. The true concept of tribal identity is inextricably linked between tribal members' belief in a particular creation story and their local environment; the mountains, the forests, the rivers, the wetlands and the ocean.

The food harvested from these areas, providing sustenance to the iwi, and the localised knowledge passed down to train successive generations to know when, how and where customary food is gathered, defines them as tangata whenua or people of the land. From the time they are conceived to the time they learn to take their place in the world, including the day they die, tangata whenua are heavily influenced by the lands of their birth, their ūkaipō. The challenges of extreme weather events and the devastating impact they can have on the unwary have left an indelible mark on the hearts and minds of Māori across all of Aotearoa. Whakapapa is the link that connects Māori to this concept of a Māori worldview and to the Creation story; it makes it real for them. It places their ancestors in a model that they can understand (Roberts et al., 2004).

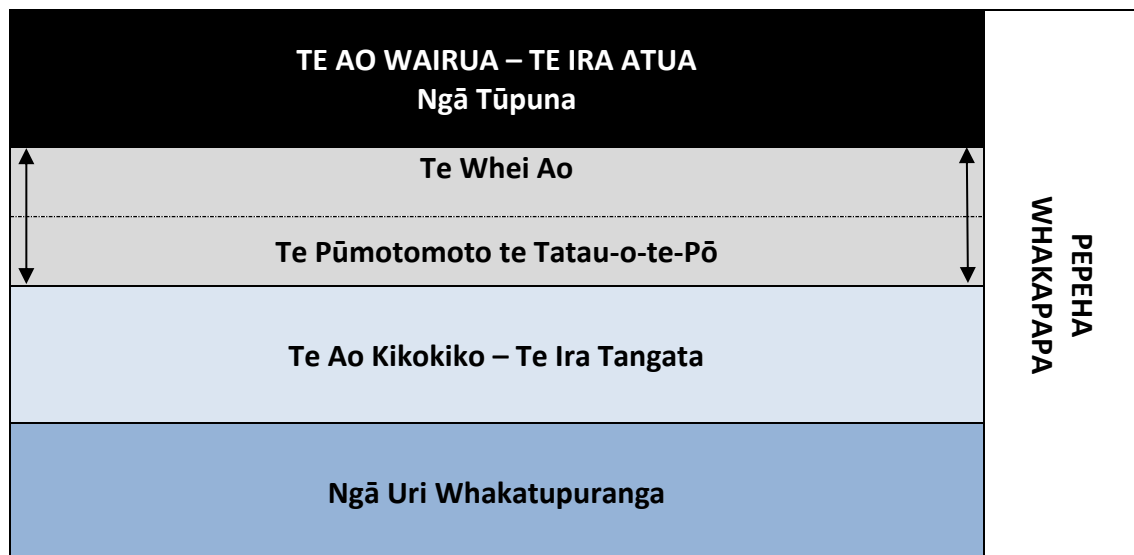
A prominent feature of the Māori worldview and Māori cosmology is how Māori, like many other indigenous, first nations peoples, personify natural phenomena and different realms of the universe. Many of the offspring of Ranginui and Papatuanuku are personified as climatic entities – including the forces of the wind (Tāwhiri-mātea), rain (Te Ihorangi), thunder (Whatitiri), lightning (Ūira), frost (Hukapapa), snow (Huka), rainbows (Uenuku) and mists (Hine-pūkohu-rangi), among many others.

¹⁵⁵ Earth mother

¹⁵⁶ Sky father

Notwithstanding the common ground this model of the universe has with other worldviews, Māori did not accept a mechanistic view of the universe. Rather, the Māori model of the universe presents us with an intimately connected physical and spiritual world – one that conceptualises the environment as a total, integrated system.

TEPŪ 5.1: TE ARONGA MĀORI - MĀORI WORLDVIEW



Tepū 5.1 is a model I designed to demonstrate the Māori worldview in a very simplistic way. It shows that above is Te Ao Wairua or the spiritual realm, where ngā atua (gods) and ngā tūpuna Māori (ancestors) reside. Behind the world of everyday occurrence is this other reality, a spiritual reality. The dotted line represents the division between Te Ao Kikokiko (the World of the Living) and Te Ao Wairua by passing through 'Te Pūmotomoto-Te-Tatau-o-te-pō' otherwise known as the 'Portal of the night'. The two arrows represent how man and spirit can pass through Te Whei Ao, Te Pūmotomoto, Te Tatau-o-Te-Pō during twilight hours. In general, Māori did not view death as an end point, but rather saw it as another stage in the journey of human existence. Another common theme for Māori is that when Māori die, the spirit returns to Hawaiki and Hine-nui-te-pō is the Māori goddess responsible for looking after the dead. There is a custom of taking our dead with our people, wherever they travel and the dead are mentioned, talked about and referred in waiata, karanga and whaikōrero.

Below that is Ngā Uri Whakatupuranga or future generations. The last part of this model that encapsulates the Māori worldview is the genealogical link or the whakapapa

between the gods, Te Ira Atua, and tribal ancestors, Te Ira Tangata, and the living, including the unborn generations. This is also known as a pepeha or a tribal, proverbial recitation that acknowledges one's sacred maunga, awa, moana, waka, eponymous ancestor, iwi, hapū and marae, linking people to place. It establishes one's identity and sense of belonging. The holistic nature of the Māori world view and the interconnectedness of these key values define who we are as Māori, by keeping us connected to the spirit world, to the physical world and into the future. Smith (1999), in her book, *Decolonizing Methodologies* provides another explanation:

For Maori there are several ways of identifying one's indigenous 'community'. One commonly used way is to introduce yourself by naming the mountain, the river, the tribal ancestor, the tribe and the family. Through this form of introduction you locate yourself in a set of identities which have been framed geographically, politically and genealogically (p.126).

Prevailing winds, unique weather phenomena, and weather patterns unique to their tribal rohe all contribute to mould, shape and form a particular way of thinking. Tribal expert, Pouroto Ngāroipo from Ngāti Awa, Ngāti Tūwharetoa, believes that:

E noho nei tātau ki tā te whakaaro Māori titiro, e whā kē ngā ao: Ko te ao Wairua ka tahi, ko te ao tuarua te ao o ngā tīpuna, ka toru, arā, ko te ao e noho nei tātau i roto i te aotūroa; kātahi ko te ao o Rarohenga. Ko tātau tēnei e noho nei, te ao o onamata, te ao inamata, anamata. Nō reira ko te ao hurihuri, ko te ao Pākehā; ko te ao Māori, ko te ao rangatira. Kei konei katoa ērā ao, haere tahi ai, nō reira tēnei huarahi, ehara i te huarahi māmā.

In a Māori world view, there are four worlds. The spirit world is one; the second, the world of our ancestors; third, the world we live in; then the Underworld. The past, the present and the future. So the changing world is the world of the Pākehā; the Māori world is the world of chiefs. All exist in the world we live in, together. This path is not an easy path. (Ngāroipo, 28 June 2015).

It is this interconnectedness that lies at the heart of the way Māori view the world. This holistic approach is grounded in whakapapa (genealogy), the very foundation upon which all things are linked back to the beginning of time itself - ultimately to Te Ira Atua (gods). Royal (2002) explains in more depth about his own journey of whakapapa insight:

As my knowledge of whakapapa grew, I came to understand that the various complex genealogies all eventually lead to an originating point in the so-called 'creation' of the world. A significant discovery was to learn that 'creation' traditions are not explanations concerning an 'historical' creation of the world but rather they are complex image statements about reality as we presently experience it. Particularly my oral recitation of 'creation' traditions confirmed to me that these knowledge tools

(creation stories and genealogies) are recited orally in order to effect an experience of the here and now. (p.21).

It is this relationship that explains the way Māori viewed and personified their natural environment. They relied on these natural resources for sustenance. To ensure that these resources were sustainably managed, appropriate karakia (incantations) were offered to ask for permission before harvesting took place and also to give thanks.

Many Māori might not know how to clearly articulate what a Māori worldview might mean to them, but many could at least recite their tribal pepeha during a whakawhanaungatanga¹⁵⁷ session. As an example here is one part of my mother's pepeha:

*Mai Moehau ā waho ki Te Aroha-ā-uta, Te Aroha ki tai ngā maunga
Rere iho ana ngā awa teretere o Ōhinemuri, o Waihou, o Piako
Ki te kōngutuawa, ki te moana-tīkapakapa-o-Hauraki
Ko Tainui te waka
Ko Marutūāhu te tangata
Ko Hauraki te whenua
Ko Ngāti Tamaterā,
Ko Ngāti Pāoa,
Ko Ngāti Maru,
Ko Ngāti Hako
Ko Ngāti Porou ngā iwi
Ko Marutūāhu Kōwhao rau e¹⁵⁸*

In the aforementioned pepeha, sacred maunga are stated first, then the streams that flow down into the waters of Tīkapa Moana. The ancestral canoe is then named, followed by the eponymous ancestor, sacred land and the tribal descendants last. This model encapsulates the Māori worldview in a very succinct way; a very Māori way.

Now we are going to move from how Māori define their reality, their worldview, to explore how Māori theorised about how the world as they understood it was created.

2. TE AO WAIRUA – SPIRITUAL WORLD

An integral part of the Māori worldview involves Te Ao Wairua or the spiritual world. I have noticed that spiritual aspects of indigenous knowledge are rarely addressed in any

¹⁵⁷ Process of establishing relationships with a group of strangers

¹⁵⁸ Te Whare Wānanga o Te Kāhū Kōrako

of the research papers on weather phenomena, which have been conducted mainly by non-indigenous researchers. This is why I have included this area of enquiry, to explain why Te Ao Wairua, including Māori divination, has a rightful place in this thesis.

Robinson (2005) believes that through dedication, diligence and discipline one is able to see many hidden things. Being brought up since birth to know every part of your environment, the interconnectedness of everything, including an intimate understanding about one's genealogical ties to the gods, a tuakana-teina relationship, may allow unique insights in those who know or have been trained to know, the 'tohu'; the 'signs' or weather phenomena that are either physical or spiritual in nature. Many of these tohu are physical phenomena, like thunder, lightning or fog, but sometimes local Māori recognised these tohu as spiritual, celestial phenomena that had another, deeper meaning associated with them. Māori used their sensory perceptions to be 'in sync' with the rhythms of the natural environment. It is this interconnectedness that some individuals are born possessing the ability of a matakite or the ability perceiving things beyond the natural range of the senses or second sight (pp. 189-213). The usual Māori belief was that the supernatural would manifest itself by means of predictive signs or omens (see section on Ngā Tohu Taiao).

A number of tohu aituā and tohu mate are listed below:

TOHU AITUĀ:

1. Incomplete, or a pale, light-hued rainbow
2. Crescent moon and star

Tohu aituā are signs or omens that are believed to be unlucky; possible signs of misfortune, a disaster, a calamity, or an unfortunate accident that may occur in the future. This term traditionally meant that there were reasons for the tragedy, including mākutu (bewitching), violation of tapu, or some other disturbance to the natural order. According to Best (1972) a tiramaroa is a bright light that is sometimes seen moving along the peaks of mountain ranges. Best's informant Tutakangahau refers it to a kehua, whakahaehae, tūrehu, and a wairua (p. 857)¹⁵⁹.

¹⁵⁹ Ghost, spiritual being, fairy, spirit

TOHU MATE:

1. Lightning bolts - Maunga Hikonga Ūira, Rua Kanapu, Rua Koha: Usually twin bolts of lightning striking the summit of a sacred mountain¹⁶⁰
2. Fog or mists on sacred peaks
3. Wind
4. Rain

Tohu mate are signs that iwi believe indicate someone is about to die. There are numerous tohu mate throughout the motu, demonstrating the significance Māori placed on observing their local environment for these types of spiritual signs. The importance of a revered, sacred maunga to Māori cannot be underestimated. Iwi and sacred maunga are inextricably linked. The collective identity and mana of a people that descend from their eponymous ancestor is synonymous with their celebrated maunga. Sacred maunga like Moehau, Tihirau, and Aoraki visibly reflect the mana of the local iwi. Therefore when double-forked lightning strikes the mountain peaks, the tohu is not seen as a positive one. Elders often commented about the characteristics of inclement weather, such as black, billowing thunderclouds, howling wind and torrential rain as a 'bad sign'.

The Kaupapa Māori methodology that underpins this thesis should not have to rationalize, quantify or justify in any way Māori cultural practice; it is what it is. Te Ao Wairua is an essential part of that thinking that does not fit into the 'mainstream way' of academia. What it attempts to do is to include a fundamental part of Te Ao Māori and introduce it into the world of academia.

3. NGĀ MAUMAHARATANGA – MNEMONIC OR MEMORY TECHNIQUES

Historically Māori had an oral culture. They used mnemonics or memory techniques, which are memory aids or cues that tūpuna used in order to remember vast details of information such as whakapapa. The word "mnemonic" originates from the ancient

¹⁶⁰ Examples of maunga hikonga ūira are: Maungatautari, Taupiri, Kakepuku, Tauhara, Matawhaura, Tūwatawata, Moerangi, Tawhiuau, Te Rangi-pihere, Te Peke-a-Tumariu, Te Aka-puahou, Tauwhare. There are many others

Greeks, referring to memory and remembrance, and more particularly, the art of memory. The Greeks recognised two types of memory:

- Natural memory, and
- Artificial memory

Natural memory is instinctive and artificial memory involves training to improve on normal memory retention. Many memory techniques are based on the general memory strategies that were presented earlier. Although it can be easiest to remember those things that you understand well, sometimes you must rely on rote memory (Vansina, 1985, p. 147). The following corpus of mnemonic techniques can be used to facilitate such memorisation. One such technique was used by whaikōrero exponents to remember what they wanted to say; they would identify in their mind a journey that they would take. Being an oral culture there was a huge dependence on memory retention and this is why Māori viewed the head as the most sacred part of the body. Tohunga were the human receptacles of the sum total of knowledge that the iwi held (Robinson, 2005).

Typical mnemonic techniques used by Māori are:

Pūrākau (local history): Important events are marked in many ways in the consciousness of the Māori, such as changing hapū names to reflect loss of life due to drowning, to ensure that succeeding generations learn not to make the same mistakes.

Whakataukī (tribal proverbs): At times whakataukī tended to be formulaic in structure. If a particular tohu was observed in their locality then the expected outcome could be predicted with reasonable accuracy. For example: Ka pūehu te pae, he hau tonga kai te haere – When the horizon (seaward) has a dusty appearance, a southerly is expected:
A Indicator (Dusty appearance) + **B. Location** (Horizon) = **C. Outcome** (Gale force southerly, and torrential rain in 3-4 days, striking the coast).

Wāhi ingoa (place names): Embedded across the landscape are place names that reflect intimate knowledge of the locality. Place names, in effect, were the first hazard

management systems put in place by local Māori to remind themselves of local hazards, such as Rangipō (Jones & Biggs, 1995; Davis, 1990, p. 35; Hochstetter 1867, p. 391; Stokes, 2000, p. 16). The meaning is in reference to the spiritual battle between Ngātoro-i-rangi and Hape-ki-tua-rangi, when day turned to night. The Central Plateau can be experiencing a fine, clear day, and then in an instant a storm front can sweep through the area, turning it freezing cold.

Whakapapa (genealogy): Learned individuals, such as tohunga, created whakapapa or genealogical lines of descent to make better sense of a complex world. A relevant example is how one of the original iwi of Te Wai Pounamu-Waitaha created a whakapapa for the local winds that provided an insight into their worldview and the impact those winds had on their daily lives.¹⁶¹ Roberts (2004) captures this sentiment by comparing it:

...to an epistemological framework in which perceived patterns and relationships in nature are located. These nonhuman whakapapa contain information concerning an organism's theorized origins from supernatural beings, inferred descent lines, and morphological and ecological relationships. In this context whakapapa appear to function at one level as a "folk taxonomy," in which morphology, utility, and cultural considerations all play an important role. Such whakapapa also function as ecosystem maps of culturally important resources. More information and meaning is provided by accompanying narratives, which contain explanations for why things came to be the way they are, as well as moral guidelines for correct conduct (Abstract).

Waiata (dirges, laments, lullaby): There are many waiata that use metaphor to mirror the depth of feeling one experiences at the loss of a loved one by incorporating, for example, the use of dark rain clouds, a chill wind that appears from out of nowhere, or lightning bolts striking sacred mountain peaks. A feature of waiata tangi is that the first sentence or the first verse usually starts with a reference to rainfall, clouds or some type of weather phenomenon depicting death or misfortune.

*Tērā te ūira e hiko i te rangi
E wāhi rua ana rā runga o Tauwhare
Kāore ia nei ko te tohu o te mate (Ngāta, 1928, pp. 14-15)*

*The lightning flashes in the sky
Splitting in twain over Tauwhare
Assuredly a token of death*

¹⁶¹ See this whakapapa in Ūpoko Tuaiwa

Oriori or Lullabies are another example of the importance waiata have in the dissemination of esoteric knowledge to aristocratic mothers carrying their unborn foetus. One such example is 'He oriori mō Tū-tere-moana:

*I karangatia e Tāne ki a Huru-tea-a-rangi
I noho i a Tonganui-kāea, nāna ko Pārāwera-nui;
Ka noho i a Tāwhiri-matea, ka tukua mai tana whānau,
Titi-parauri, Tiki-mātangi-nui, Titi-mata-kakā;
Ka tangi mai te hau mapu, ka tangi mai te rorohau (Ngata, 1980, pp. 4-5)*

*Tāne called upon the White-glow-in-the-Heavens,
Spouse of wayward southerly gales, who begat the mighty northerly blast;
She espoused the Wind-god, and he released his family;
The Dark-piercing typhoon, the Piercing hurricane, the Hot-piercing-blast;
Thence came the raising tempest, the piercing wind*

The oriori of Tū-tere-moana was composed by Tūhotoariki. It is over 500 years old, it has 8 verses and 130 lines that describe the welcoming of an aristocratic child as its born into the world of light. The child is taken of an inspiration journey to greet his ancestors – ngā atua me ngā tūpuna. The oriori therefore is a set of instructions that provides a clear pathway for the child to eventually lead his whānau, hapū and iwi.

4. NGĀ WHAKARŌPŪTANGA – NOMENCLATURE AND CLASSIFICATION

Local kaitiaki, tohunga and kaumātua all applied themselves to learn the different types of wind, rain, clouds, rainbows, mist, fog, mirages and haloes; in fact, all types of weather phenomena. Each individual weather phenomenon had its own characteristics. Māori did not take long to identify certain weather phenomena that threatened lives. Māori also studied how long they could expect before: storms would strike, flood waters would rise, or when snow would fall. To do this they needed to differentiate between cloud types or wind direction. At present I have collated 800+ wind names, 500+ rain names and 350+ cloud names, including a number of other weather phenomena.

5. NGĀ TOHU HUARERE, ĀHUARANGI ME TE WĀHANGA O TE TAU – ENVIRONMENTAL INDICATORS OF WEATHER, CLIMATE AND SEASONAL PREDICTION

Like other indigenous peoples from temperate and tropical climates in America, Africa, and the Pacific including Australia, Māori have traditionally defined each season by observing the flowering times of plants, the migratory arrival and departure of birds (i.e. pīpīwharau, koekoeā, kūaka, titi) fish and marine mammals such as moki, kahawai

and whales, and localised weather too, signalling a warming in the weather patterns and longer sunshine hours. Only after many generations living in a particular location do these patterns become known and in some instances become intuitive in order to keep them safe from harm. The ability to accurately predict the weather and climate in Aotearoa was a necessity. Without this skill, you were vulnerable to the variable nature of the weather, especially in remote mountainous locations where snow can fall overnight or flash flooding can occur.

6. TIROHANGA WHĀNUI – LONGITUDINAL OBSERVATIONS

This component of the research was necessary to enable me to gain a better understanding of the interviewees' lifetime experiences and observations of local weather and climate. Many of the interviewees, more often than not, were brought up by their grandparents or in some cases their great-grandparents, who were very knowledgeable in local, tacit weatherlore. Their collective memories could reach back approximately 150 years, and the importance of this fact was not lost on me. Those who fell into this category were ideal participants as they could provide local weather and climate comparisons between the past and the present. What is more compelling though, is that many indigenous peoples around the world have experienced, and still are experiencing, similar observations to Māori; the climate in their country is getting warmer and they cannot rely on their *tohu* any more to enable them to understand what the weather is doing.

7. AKORANGA – SPECIALISED TRAINING

For Māori, living in a harsh, new environment demanded a precise and intimate knowledge to survive the many known and unknown risks they faced on a daily basis. To avoid starvation they had to learn at a young age how to maximise their chances of survival by learning from their elders how and when to hunt, fish, sow seed, harvest; all the necessary skills they needed to succeed in acquiring enough food for their people. Some of these skills required special training that was kept amongst certain *whānau*. The more special the skill set, the more *mana* this *whānau* received, and therefore the more protective the holders of this knowledge tended to be in order for the *mātauranga* to remain within their kin. There are many challenges facing these few knowledge

holders and cultural practitioners who still retain the knowledge and skill of their tūpuna. However, the most challenging one today is trying to encourage their tamariki and mokopuna to put down their cell phones and ipads and go out on a stormy, freezing cold night, in muddy conditions, to learn for example, how to catch tuna. Unfortunately, the current generation are not winning this battle and are wondering whether they may have to go outside of the whānau in order for the mātauranga to survive.

8. WHAKARITENGA ME NGĀ TAPUTAPU – APPLICATION AND TOOLS

Our tūpuna used a number of applications and tools to improve the accuracy of their weather predictions or to influence the weather. A high headland, lying in an east-west orientation to provide 360-degree visibility of the sky above and the local surroundings below is the ideal location from which to make daily weather predictions. Some examples of applications and tools that tohunga kōkōrangi and other practitioners used, relevant to weatherlore, are contained in Tēpu 6.2 (Rangi Matamua, personal communication 2011).

TĒPU 5.2: WHAKARITENGA ME NGĀ TAPUTAPU – APPLICATION AND TOOLS

TOOL OR APPLICATION	EXPLANATION
Maramataka	Lunar environmental calendar
Tūāhu	Shrine. Wāhi tapu that energises karakia or communication with atua and te ao wairua
Huruhuru manu Huruhuru tara Makawe	Feathers were held when karakia concerning the weather were conducted. If overtaken by a storm while at sea, a tohunga would say to his wife, “whakaarahia te huruhuru,” and she would remove a pubic hair to be used by her husband with the Karakia kia patu i te āwhā (Best, 1976, p. 334). Hairs from the tapu heads of tohunga were thrown into the moana to calm storms (Buck, 1950, p. 503).
Purerehua	A taonga pūoro, a bullroarer; used to invoke rain (H. Melbourne, personal communication, 2002).
Karakia Ngeri Haka	Incantation. See Ūpoko Tuawhā – Whare Wānanga. Ngeri and haka are ceremonial dances that are uttered after karakia.
Kōiwi tohora Kōiwi	Whale bone and human bone. Used to enhance the words of the karakia.
Kapehu	Compass. When travelling on waka, it can become a compass to provide a basis to locate cardinal directions.
Oko Hue	A bowl called Tipoki-o-rangi, when uncovered, thunder resounds. Ornamental gourd called Whitiri-pakapaka, when uncovered, thunder and rain follow.

Taumata atua Whakapakoko Karetao	Godstick and puppet. Both these taonga were used as a medium for communicating with atua
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Maramataka: A key cultural practice that allowed our tūpuna to adapt to their new environment was the ‘maramataka’ or the lunar environmental calendar. It was our unique system of marking time based on the number of nights taken to by the moon to complete a revolution of Papatūānuku (Roberts et al, 2006; Clarke & Harris, 2017). The maramataka was viewed as a survival technique, an essential tool to note daily changes of each lunar phase and the influence it had on the environment including when the right time for certain activities occurred, such as sowing, planting, harvesting, or fishing. Each moon phase varied from rohe to rohe due to topography, mountain ranges, valleys, ridges and flood plains right down to the coastline. The maramataka acted as an environmental indicator for the right time to commence certain activities, the right time to caution against certain activities and the right time to bring these activities to a conclusion within the three main areas: Rangi – whenua – awa / moana.

Joan Ropiha (2010) conducted an exploratory study on the ‘Traditional Ecological Knowledge of the Maramataka’. Ropiha states in her findings that:

“the Māori names of the nights of the moon and charts of the maramataka are encoded ecological knowledge i.e. embedded with ecological knowledge about the nights of the moon cycle and their influence on fishing and planting activities. This knowledge would be revealed, it is assumed, by further studies on the traditions of the names of the nights of the moon, and the maramataka charts (p. 47).”

There are other close colleagues who have done a significant amount of research to revitalise maramataka and embed it across many activities here in Aotearoa, such as Professor Rangi Matamua, Dr Pauline Harris, and Rereata Makiha. Through their efforts the importance of Maramataka in our everyday lives is becoming more apparent by providing a baseline to allow local assessments to take place. Maramataka is fast becoming a relevant tool to ascertain when to do particular activities and when to rest and to take stock. Budding maramataka practitioners need to understand the differences of each lunar phases to properly utilise the maramataka’s full potential.

I asked Uncle Bill, “Should maramataka be included in my thesis?” He replied, “The maramataka is the foundation of that body of localised tribal weather lore. If you **don’t**

include the maramataka, your thesis would fail.” (W. Tāwhai, personal communication, April 2009).

HE WHAKARĀPOPOTOTANGA - SUMMARY

Ūpoko Tuaono has explored the rationale for creating a conceptual framework coined Ngā Whenu-tapu-e-waru model as a basis for better understanding how iwi have developed and applied this body of localised environmental knowledge known as MEK of weather and climate in their rohe, over many generations.

The following three Case Studies will apply `Ngā Whenu-tapu-e-waru’ model to each tribal entity in order to address the key research questions posited at the commencement of this thesis. At the beginning of each case study a background description is provided, i.e., rohe (region) where the iwi are located; te huarere me te āhuarangi (local weather and climate)¹⁶², and pūrākau-ā-iwi (tribal history). This is to establish with greater clarity the interconnectedness, the proficiency and awareness each iwi had with their local environment in order to survive any weather extremes that might come their way. At the end of each case study a summary highlighting the key findings will be provided

¹⁶² I sourced NIWA climate data to provide a general understanding of local climate for each iwi

Ūpoko Tuawhitu: Wāhi Rangahau Tuatahi - Tainui

Case Study One: Te Ika-a-Māui – Hauraki-Tainui

ROHE - REGION

The Tainui region is extensive. For the purposes of this thesis I have decided to select only one of the Tainui confederation of tribes - Hauraki. This area is encapsulated in the following tribal pepeha:



Mahere 1: Hauraki Rohe (Region)

*Ngā Puke ki Hauraki ka tarehu
E mihi ana ki te whenua
E tangi ana ki te tangata
Ko Moehau-a-waho
Ko Te Aroha-a-uta
Te Aroha-ki-tai
Ngā maunga hakahaka
O Te Tara-o-Te-Ika-ā-Māui
Ko Waihou, ko Ohinemuri, ko Piako
Ngā awa teretere
Putu atu i te kōngutawa
Ki Te Moana-Tikapakapa-o-Hauraki
Ko Tainui te waka
Ko Marutūāhu te tangata
Mai Mahurangi ki Ngā Kuri-o-Whārei
Mai Matakana ki Matakana
Ko Marutūāhu Kōwaho rau e!*

The traditional tribal boundaries of the Hauraki rohe were described by my uncle Taimoana Tūroa as commencing at Te Ārai in the north near Matakana, extending southwards towards Tāmaki-makaurau, passing Mahurangi, Whangaparāoa, then crossing the Waitematā Harbour and the Tāmaki River to the east, following the coastline to Orere. The boundaries then turn southward again along the Hunua Ranges, passing Wharekawa, Whakatīwai, Waitakaruru, turn east along the Hauraki Plains, the southern-most part of Tikapa Moana known as Tahuna-kaitoto, crossing the mouths of the Piako and Waihou Rivers to Kōpū. From Kōpū the region extends north along the

coastline all the way to the top of Te Tara-o-Te-Ika¹⁶³ is Muriwai, located beneath the shadow of Mt Moehau. Slightly further north is a small island called Mangamanga, the place where Hauraki spirits of the recently deceased rest before departing to Hawaiki. From Mangamanga the boundary moves down past Te Tangiaro-o-Kahumatamomoe, southwards to Ngā Kurī-o-Whārei, a submerged reef just north of Matakana island. The region continues by crossing the Tauranga Harbour to Te Puna to the south-west, then turning north-west across the Kaimai Ranges to the west at Waiharakeke south of Mt Te Aroha and crossing the Hauraki Plains to Mirimirau, Whatitokarua and Te Hoe-o-Tainui. It then follows the western flanks of the Hapu-ā-Kohe Ranges in a nor-westerly direction past the Hunua Ranges to Moumoukai, reaching Tāmaki-makaurau and then crossing over the Waitematā Harbour, then up along the eastern seaboard to Mahurangi and Matakana, and back to its commencement point at Te Ārai. The seaward boundary of Hauraki starts at Te Ārai, crossing the moana in a south-easterly direction to the southern part of Aotea (Great Barrier Island) and then down the eastern seaboard, to within the upper part of Tauranga Moana – Te Puna Katikati, including all the Islands above Matakana, but not including Tūhua (Tūroa, 2000, pp. 34-37).

TE HUARERE ME TE ĀHUARANGI – LOCAL WEATHER AND CLIMATE

The Hauraki rohe usually experiences a moderate climate with mild, wet winters and warm summers. The formation of sea fog located along the southern Hauraki Gulf is a feature during windless days in the winter months. The cold waters of the Waihou, Piako and Waitakaruru rivers flowing into the warmer sea waters of Tīkapa Moana cause spectacular banks of sea fog to form. This was a weather indicator to Hauraki tūpuna that a fine day was expected (Baggs, 2010). The high, steep, mountainous ranges and rugged valleys are very exposed during the summer months to sweeping storm fronts from the northwest, and tropical cyclones that sweep down from the tropics dumping high levels of rainfall. Three to four days of continuous, heavy rainfall falling on Te Tara-o-Te-Ika will cause widespread flooding on the plains below in Manāia, much to the delight of the local schoolchildren (Renata, 2011). Evidence of land slips and erosion is visible everywhere due to constant wind and rain action, especially along the west coastline of the Coromandel Peninsula. Because of the combination of mountains and

¹⁶³ Coromandel Peninsula.

lowland plains this region of Tainui has a wide range of climate types. Tāmaki-makaurau is an example where it is not unheard of to experience four seasons in one day. This highlights the variable nature of the local weather conditions in the Hauraki region.

Winds: Generally Spring is the windiest season. The greatest wind speeds occur in the early afternoon, due to the heating of the land surface. This causes stronger winds blowing above and over the steep ranges, resulting in turbulent downdrafts, especially near coastal areas like Harataunga and Whitianga¹⁶⁴. Paeroa is another place that is susceptible to gusty winds in excess of 124 km/hr (Chappell, 2014, p. 14). At night the winds generally die down to light breezes.

Rainfall: Is highest on Te Tara-o-Te-Ika; the Coromandel Ranges can receive annual rainfall in excess of 2000 mm. Whitianga is one of the rainiest places in Hauraki and throughout all of Tainui (p. 14). Therefore, much of the Hauraki land is mountainous, bordered by steep, extensive valleys and formerly clothed in towering kauri forests, with many creeks feeding the peat swamp lands down on the flood plains before the Ōhinemuri, Waihou and Piako rivers flow out into the Tīkapa moana, now known as the Hauraki Gulf.

PŪRĀKAU-Ā-IWI – TRIBAL HISTORY

Migration of Tainui waka to Aotearoa: Hoturoa¹⁶⁵, the high priest and navigator was responsible for the Tainui waka and his relations while crossing the Pacific ocean from Rai’ātea – Tahiti to Aotearoa. He left behind his father, Auaukiterangi and his eldest brother, Pūmaiterangi in Rai’ātea. The following whakataukī was chosen deliberately to demonstrate the character, innate skill, calibre and courage of our Tainui tūpuna Hoturoa when he and his relatives made the exceptionally difficult choice to leave Hawaiki for a new beginning in Aotearoa, “Tukua atu māua ko Tamatea ki te moana, whawhai ai.” - “Let Tamatea and me fight it out at sea” (Jones & Biggs, 1995, pp. 30-31). This whakataukī demonstrates that Hoturoa was not at all concerned about leaving during the most challenging season of the year when the winds were blowing in the

¹⁶⁴ The prevailing wind is usually from the southwesterly quarter.

¹⁶⁵ Hauraki has an old kōrero that Hotunui I, Hoturoa’s tuakana was originally responsible for Tainui. An incident involving his wife caused Hotunui I to defer to his teina Hoturoa.

wrong direction to where he was headed. The belief was that he was supremely confident not only in his skills but in the skills of all his crew members, especially the celebrated Tohunga extraordinaire, Ngātoro-i-rangi and his wife Kearoa. Te Rangihiroa¹⁶⁶ (1950) gives a fuller account of the type of seafarers the Tainui ancestors were:

An incident in the sailing of the Tainui illustrates the fearlessness of those early seafarers. The date set for sailing was Orongonui (28th) night or morning of Tatau-uruora, the lunar month corresponding to the overlapping in the European calendar months of November and December. This was said to conform to the time given by Kupe as the most favourable season of the year for the voyage. The Māori calendar consisted of a sequence of lunar months in which each night was named from the first night of the new moon to the last night of the next new moon. The three or four nights at the end of the first quarter of the moon were named Tamatea with qualifying terms. The end of the first quarter was regarded as being marked by rough weather at sea (p. 47).

Although Hoturoa was advised not to leave until the Tamatea lunar phase had past, Hoturoa replied to his people: “I will sail on the Orongonui and fight Tamatea on the open sea.” Jones (1995) gives a Tainui account of their ancestral waka and their ancestors departure:

Ko te marama i rere mai ai a Tainui, ko Hakihea (Tiihema) i te whaa o nga[a] raa o te marama, araa, ko Oo-Uenuku taua raa. I te waa ka tata te haere mai, ka karanga mai ngaa taangata i uta, `E Hotu, taihoa e haere, ko Tamatea teenei!’ He whakatuupato mai teeraa mo[o] nga[a] raa tuaono ki te tuaiwa o te marama kua tata mai. Ko te ingoa o aua raa eenei: Tamatea, Tamatea-kai-ariki, Tamatea-waananga, Tamatea-aaio. He raa tuupuhi aua raa, e ai ki taa te Maaori koorero. Ka utua atu e Hoturoa, `Tukua atu maaua ko Tamatea ki te moana whawhai ai (p. 30).

Tainui came in the month of December, on the fourth night of the moon, the night called Ūenuku. When they were about to come the people ashore shouted, `Hotu, wait! Today is Tamatea!’ That was a warning about the sixth to ninth nights of the moon which were approaching. Those nights are named Tamatea, Tamatea-eater-of-chiefs, Tamatea-the-awesome and Calm-Tamatea. These are the stormy days according to Māori lore. Hoturoa replied, `Let Tamatea and me fight it out at sea (p. 31).

The Tainui oral account states that Hoturoa and his distinguished crew fought against the head winds with adverse weather and sea conditions during a Tamatea lunar phase and survived. Without the guidance and expertise of the tohunga navigators, our Polynesian ancestors would have found it near impossible to complete their journey. Oral accounts describe how tohunga conducted karakia rotu moana¹⁶⁷ or awa moana to

¹⁶⁶ Also known as Sir Peter Buck

¹⁶⁷ Karakia rotu moana and awa moana are incantation’s to calm the oceans

improve the weather conditions and calm the sea, and called taniwha to swim ahead of their waka to block incoming swells. The Tainui waka encountered huge swells as they entered through the reef of Pikopikoiwhiti Pass. Ngātoro-i-rangi uttered a karakia causing the ocean to be calm until they arrived at Rarotonga (p.30-31). Oral history and manuscripts written by Tainui elders suggest that Tainui and Te Arawa ancestral waka have shared whakapapa, migration stories, kawa, tikanga, and also esoteric lore. No other iwi share the same philosophical worldview. Apirana Ngata suggested that the two were in fact a double-hulled voyaging canoe and known as Ngā Māhanga-a-Tuamatu (Ministry for Culture and Heritage, 2006, p. 64). What is known is that Tainui made landfall at Whangaparāoa near Tihirau at a place called Te Taunga Waka¹⁶⁸. After living for a short period of time in this locality, the majority of the crew then sailed along the coastline of Te Moana-o-Toi to Moehau, and then over to Tāmaki, crossing the Tamaki Isthmus into Te Mānukanuka-o-Hoturoa (Manukau Harbour) travelling southwards down the west coast to eventually settle at Kāwhia. From here the descendants of the original Tainui crew members make up the Tainui Confederation of Tribes, which are: Waikato¹⁶⁹, Ngāti Raukawa, Ngāti Toa Rangatira, Ngāti Maniapoto and Hauraki (Ngāti Tamaterā, Ngāti Pāoa, Ngāti Maru, Ngāti Whanaunga, Ngāi Tai).

Hotunui and his son Marutūāhu: The introduction of the Tainui people to the Hauraki rohe occurred after Hotunui, the son of Ūenuku-tūwhatu, left his pregnant wife Mihi-rāwhiti at Kāwhia, after being accused of theft. When his son Marutūāhu grew to manhood he set out to find his father. He located his father living in Hauraki. Marutūāhu took to wife two sisters, Paremoehau and Hineurunga from Te Uri-o-Pou. He had five sons, Tamatepō, Tamaterā, Whanaunga, Te Ngakohua and Tāuru-kapakapa. He found his father, Hotunui, at Wharekawa where he had remarried. It was here that Marutūāhu learnt that the tangata whenua had for a long time mistreated his father. After careful deliberation with Hotunui, Marutūāhu and his sons commenced the systematic conquest of the toiwhenua¹⁷⁰. The descendants of Marutūāhu and the toiwhenua were domiciled predominantly on the fertile flood plains along the coast, the waterways, or amongst the peat swamps of the Hauraki Plains, close to the rich, abundant food and

¹⁶⁸ See Te Whānau-a-Apanui

¹⁶⁹ Now known as Waikato-Tainui

¹⁷⁰ Original inhabitants, i.e. Te Uri-o-Pou, Ngā Marama, Ngāti Huarere, Ngāti Hako, Ngāti Hei, Te Ūpoko-tioa

natural resources. The descendants of the original settlers developed skills as fishermen, divers and gardeners, based on local maramataka. Adherence to the unique characteristics of each lunar phase ensured their continued safety; fishing catches were usually successful, and birdlife abundant.

MĀTAURANGA TAIAO HAURAKI – HAURAKI ENVIRONMENTAL KNOWLEDGE OF WEATHER AND CLIMATE

In the 'He Tīmatanga Kōrero' section, I explained the genesis of this thesis. Ngāti Parewahaika-Ngāti Tamaterā from Hauraki was one of the participant groups. This first Case Study was an opportunity for me to address gaps in the initial research. The first round of semi-structured, and open one on one interviews was conducted within the homes of Hauraki kaumātua. A total of 11, both kaumātua and cultural practitioners were interviewed over a period of 6 years from 2009-2015. Many of the participants are closely related to me. I have also sourced other relevant information from previous conversations with six Hauraki kaumātua¹⁷¹, or from secondary sources.

1. Te Aronga-ā-Hauraki – Hauraki Worldview

Because very few of the Hauraki participants could with confidence explain a particular 'traditional' Hauraki worldview, I decided to use Pei Te Hurinui Jones' whakapapa located in Te Tuhi Mareikura (Jones, 2013b, pp. 65-70). He sourced this mātauranga from his grand uncle, Te Hurinui Te Wano from Ngāti Maniapoto, who compiled Tainui priestly lore. The last known Hauraki Io high priest was Tīwai Paraone from Ngāti Pāoa



Whakaahua 1: Te Paki-o-Matariki - Nā Te Mihinga Kōmene

(Paraone, 1907, pp. 109-199). His teachings are much the same as those of Te Wano, strongly suggesting that Tīwai had undergone the same or similar instruction. The following whakapapa illustrates the spiritual interconnectedness between the creation of the universe, the gods and mankind from a purely Tainui perspective, of which

¹⁷¹ See Appendices

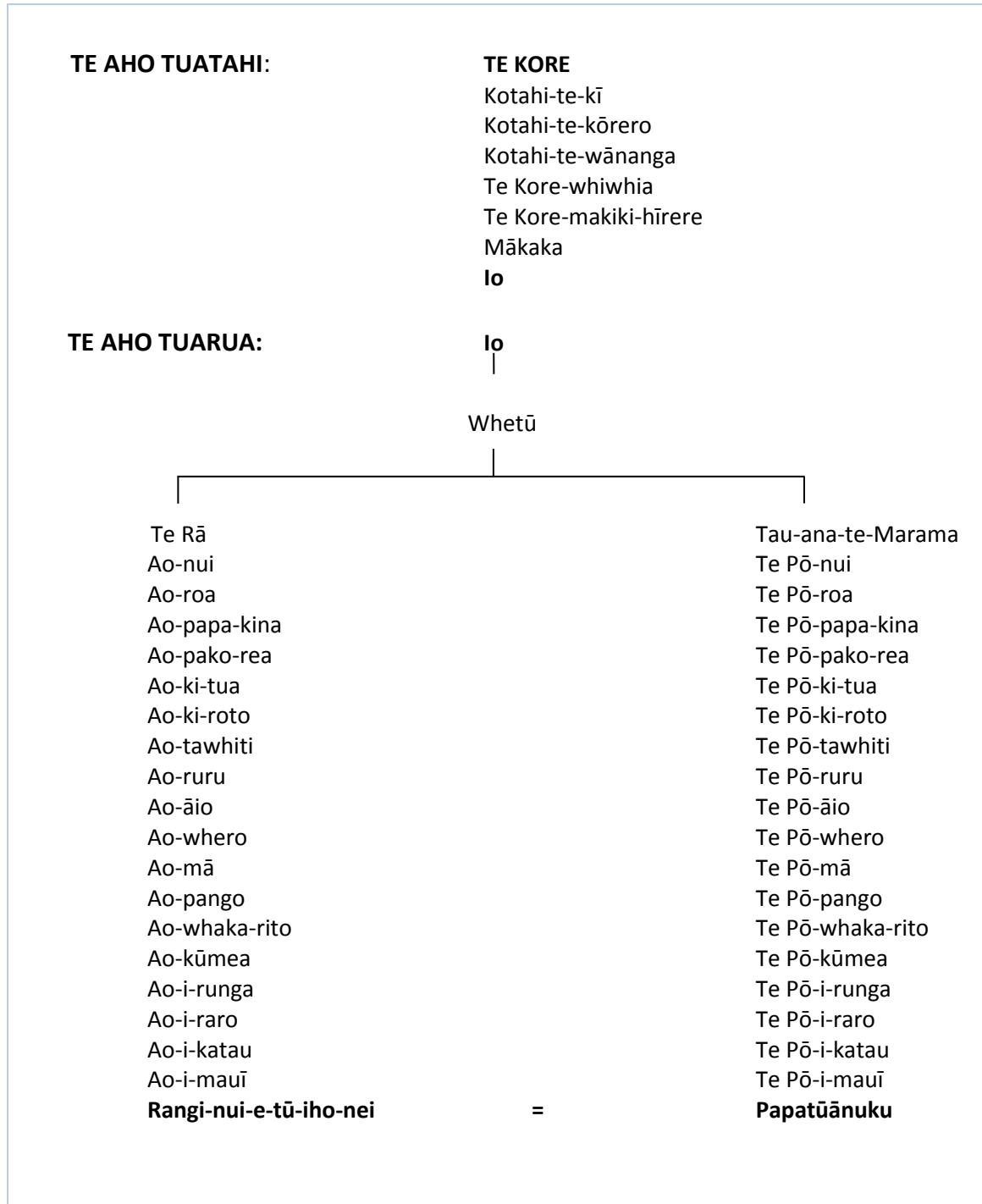
Hauraki is a part. The second Māori King, Kīngi Tāwhiao, instructed Tiwai Paraone and Te Aokatoa¹⁷² to create a sacred coat of arms for the Kīngitanga (see photo). It was called Te Paki-o-Matariki – The Widespread calm of the Pleiades (Kirkwood, 2000, pp. 109-110). The central spiral design symbolised the creation narratives of mankind, flanked by two supernatural beings, called Aituā (misfortune) and Atuatanga (Giver of life). Located directly above was another spiritual entity known as Manawa, which represented the spirit and soul of mankind, and at the apex was the Matariki constellation that crowned the Royal coat of arms. At the bottom were the words, ‘Ko te Mana Motuhake’ meaning ‘separate power and authority’. Through a Pei Te Hurinui elder, Te Wano, Jones posits four descent lines of whakapapa from Te Kore down to Hoturoa. It commences from Te Kore and cycles through different stages of nothingness or latent potential and then evolves through diverse forms of darkness or night, concluding with the emergence out of darkness to light (from night to day). These four strands are known as:

1. Te Aho Tuatahi: This genealogical sequence commences from Te Kore to Io and is known as **Te Whakapapa Tapu o Io** – The Sacred Genealogy of Io, in which there are 8 generations from Te Kore to Io.
2. Te Aho Tuarua: This second strand begins with Io and ends at Papatūānuku and Rangi-nui-e-tū-iho-nei and is known as **Te Whakapapa o Ngā Ao Whetū** - The Sacred Genealogy of The World of Stars. There are 22 generations from Io to Rangi and Papa.
3. Te Aho Tuatoru: The third strand starts with Rangi and Papa and ends with the demi-god Tāwhaki and two of his wives, Hine-piripiri and Hāpai. This section is known as **Te Whakapapa o Te Tangata mai i te Atuatanga** - The Sacred Genealogy of Man from the Gods. There are 33 generations from Rangi rāua ko Papa to Tāwhaki.
4. Te Aho Tuawhā: The last and fourth strand of the Tainui cosmogonic genealogy is known as **Te Whakapapa Tapu o te Tangata ki ngā Tūpuna o Tainui me Te Arawa** -

¹⁷² Another Io tohunga from Ngāti Raukawa and Waikato

The Sacred Genealogy of Man to the Tainui and Te Arawa Ancestors. There are 15 generations from Tāwhaki to Hoturoa.

TĒPU 6.1: HE WHAKAPAPA TAPU O TAINUI – SACRED GENEALOGY OF TAINUI

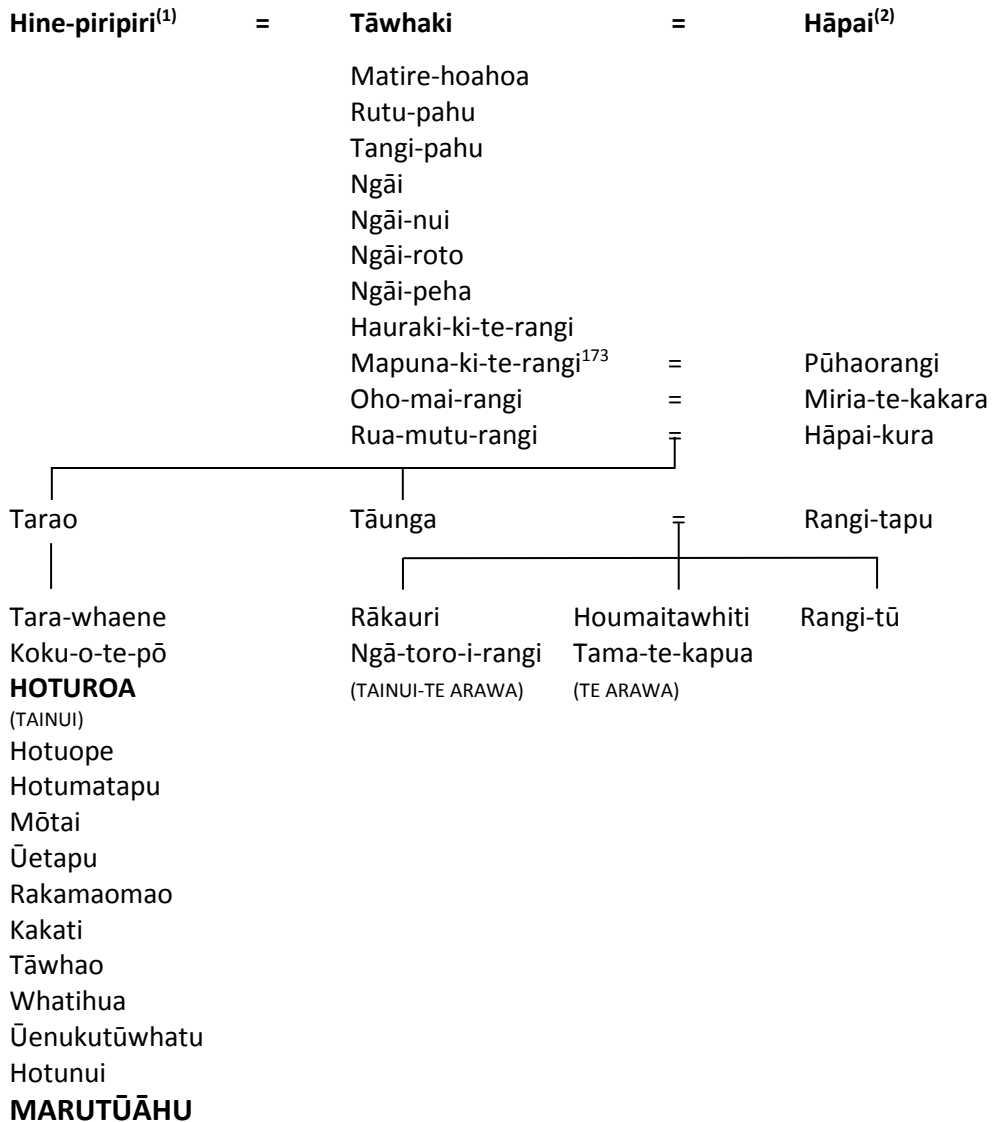


TE AHO TUATORU:



Te Aho Tuawhā: The last and fourth strand of the Tainui whakapapa is known as **Te Whakapapa Tapu o te Tangata ki ngā Tūpuna o Tainui me Te Arawa** – The Sacred Genealogy of Man to the Tainui and Te Arawa tūpuna.

TE AHO TUAWHĀ:



Tāne, with the assistance of his brothers, creates Hineahuone, and he takes Hineahuone as his wife. Over time, Hineahuone gives birth to Hine-tītama. Tāne then cohabits with his daughter, Hinetītama. She leaves Tāne after finding out that he is in fact her father. Hineahuone, who is also hurt by the actions of Tāne, leaves him as well and takes Tūmataunga as her husband. She gives birth to Aitu-ā. The genealogy traces 31

¹⁷³ Also known as Te Kura-i-monoa

generations from Aitu-ā to Tāwhaki, who acquired Ngā Kete o te Wānanga or the Kits of Esoteric Knowledge for the betterment of Mankind.

Tainui and Te Arawa are inextricably linked by whakapapa, by waka, and by kawa. Tainui and Te Arawa are the only ones who share the same kawa – Tau-utuutu. It is this special relationship that helps shape the way they think and view the world. This whakapapa is in effect the Tainui worldview framework that flows from the ultimate source, from Te Kore descending down to Hoturoa.

This tātai whakapapa draws a long, continuous line of direct descent from Te Kore to Hoturoa, a total of 77 generations and a further 11 generations from Hoturoa to Marutūāhu. Then there are a further 15 generations from Marutūāhu to me, a total of 103 generations, positioning this part of the thesis firmly within a Tainui waka framework.

As I cast my eyes over the 103 generations from Te Kore to myself, a descendant of all these tūpuna, the first emotion I feel is a great sense of humility and quiet pride. I also think about their lives, aspirations, trials and tribulations, how they overcame adversity and most importantly, the legacy they left for us, their descendants – their collective ancestral memories and wisdom.

Hoturoa, the eponymous ancestor of the Tainui confederation of tribes is particularly important in this context because his name establishes a crucial milestone moment in the history of the Tainui people who first migrated to Aotearoa from Hawaiki. This has the effect of linking the narratives provided in the pūrākau section of this chapter, which are implicitly understood to be set in Rai'ātea-Hawaiki and ultimately led to the re-establishment of the Tainui people at Kāwhia on the west coast, in a region extending from Matakana in the north, and to Matakana to the south-east near Bowentown (Jones & Biggs, 1995, pp. 30-36; Ministry for Culture and Heritage, 2006, p.254-255). Therefore the descendants of Marutūāhu, who migrated from Kāwhia to Hauraki to find his father Hotunui, are intimately linked to this overarching Tainui worldview. Although the Marutūāhu iwi were not the original toiwhenua, through take raupatu and ahi kā roa

they exercised their tino rangatiratanga and mana whenua for over five hundred years in these lands Ministry for Culture and Heritage, 2006, p.87-93. Hauraki iwi are arguably one the most negatively impacted iwi of Aotearoa. The close proximity of Hauraki tribal boundaries to Tāmaki makaurau,¹⁷⁴ ensured that the Pākehā colonisation machine had a devastating effect on all of the iwi, their lands, language, ceremonies, rituals, culture, leadership and general way of life. This led to the steady demise of their tino rangatiratanga and more significantly their knowledge base. The inability of tribal experts to maintain the stringent, sacred process of training tribal members, due to a swiftly changing learning environment, caused many of these tribal knowledge holders to ‘take their mātauranga to the grave’¹⁷⁵. This contributed heavily to the lack of information available about Hauraki weather, because climate and seasonal knowledge is sparse.

2. Te Ao Wairua – Spiritual World

Historically, Hauraki tūpuna skilled at divining the meaning of particular weather or celestial phenomena would explain their observations and what they meant for the wellbeing of their whānau, hapū or iwi. For instance, the paramount Marutūāhu fighting chief, Tarāia Ngākuti Te Tumuhuia, would make his own predictions by observing his war god, Kaiwaka (known as Delphinus). It is a star constellation sought for in the north sky, prior to any conflict. Tarāia inherited this mana or ability from his uncle Tū-terangiānini, a continuation of that cultural practice that maintained his connection to his ancestor Tamaterā.

According to Professor Rangi Matamua (Ngāi Tūhoe):

The Hauraki tūpuna Tamaterā was a celebrated tohunga kōkōrangī, who migrated to Whakatāne with his kotiro Te Aokuranahe and hunaonga, Tunumoho. While attending a wānanga at Ruatoki, he lost his life to Taiwhakaea due to mistaken identity. From that time onwards Ngāti Pūkeko have fought against the descendants of Taiwhakaea. His body was buried on the ridgeline at Ōwhakatoro (Matamua, 2013).

Tamaterā shared his knowledge with Ngāi Tūhoe, an iwi that also specialised in the mysteries of the night sky. It was during some informal discussions with my cousin

¹⁷⁴ Auckland City

¹⁷⁵ Taimoana Tūroa personal communication, 1997.

Korohere Ngāpō that he mentioned Tamaterā had a war god and its physical incarnation was a star constellation called Kaiwaka.

One of the main findings from the research involves the identification of different types of spiritual weather phenomena that are seen as *tohu mate*, *tohu aituā*; death signs or signs of misfortune or calamity. They seem to be a feature in Tainui. One of these *tohu aituā* that is renowned across all of Hauraki is ***maunga-hikonga-ūira***. They are known by other names throughout the motu as *rua-kanapu* or *rua-kōhā* (Best, 1972). This *tohu* involves bolt lightning striking the summit of a sacred *maunga* twice, followed by loud, rumbling thunder. When this is observed by the *iwi*, they know that either their chief or one of his family will die or a calamity will soon befall them. Other instances involve lightning strikes during *tangihanga*.

Before the death of Hauraki Ūpoko Ariki¹⁷⁶, Huhurere Tukukino from Ngāti Kiriwera-Ngāti Tamaterā, bolts of lightning struck the summit above Pōtiki-o-rehua near Taumaharua, signalling that someone was about to die. During his *tangi* on the night of the 'Pō Whakamutunga'¹⁷⁷, lightning struck again, blowing out the fuse. A similar incident happened during the death of another close relative, Kōrekoreko (Cora) Warid, my mother's *teina*. The last time this happened was during the *tangihanga* of senior Hauraki *kaumātua*, Tewi Nicholls. Kīngi Tūheitia and his entourage had just arrived at Te Pai-o-Hauraki Marae when a violent thunderstorm struck, fork lightning striking the summit of Taumaharua.

Other spiritual weather phenomena identified by participants were incomplete rainbows forming before, during and after the passing of a close relative, and fog (M.Royal & T. Nicholls, personal communication, 25 January 2003). Lightning bolts struck the Tokatea summit, followed by a storm, and then one of the *tamariki* playing in the Harataunga River was nearly swept away by the flash-flooding. Local *kaumātua* knew that what they noticed the night before was a *tohu mate*. I saw a *tohu mate* myself when our daughter passed away. A vivid incomplete rainbow formed before her death outside

¹⁷⁶ Paramount chief

¹⁷⁷ The last night before the *rā nehu* or the burial day, where there is an opportunity for *whānau* and friends to speak about the deceased.

the hospital, at the marae, then at the urupā (cemetery), and then it seem to follow us back from Paeroa to Kirikiriroa, keeping pace on the left-hand side of our truck, all the way home.

Suffice to say, these tohu reveal to me the spiritual connectedness that Hauraki iwi have with their environment, such as lightning striking mountain tops, incomplete rainbows and fog.

Tēpu 7.1 is a list of known tohu aituā and tohu mate, followed by a description and meaning of the tohu. In some instances nothing is giving due to lack of information. The last column provides further information regarding the tribe, location and informant. A reference is also provided if the information is sourced from literature.

TĒPU 7.1: NGĀ TOHU AITUĀ ME NGĀ TOHU MATE – SIGNS OF CATASTROPHE AND DEATH

NGĀ MOMO TOHU TYPE OF INDICATOR	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO TRIBE AREA SOURCE INFORMANT
MAUNGA- HIKONGA-ŪIRA – Lightning bolts striking mountaintops	MAUNGAROA: ‘Long mountain’ 193m high. Located near Te Kauwhata and Whangamarino, Maungaroa. Maungaroa was a place where tohunga conducted rituals and ceremonies. When lightning was seen striking the peaks, Ngāti Naho, a hapū of Ngāti Tipa-Ngāti Pāoa, knew that a chiefly person of the tribe was about to pass away. The chief Tohikuri said that Maungaroa was a symbol for a high chief in his tribe, “ <i>When a person of rangatira rank dies and the people are gathered for the lamentations, the orators say, addressing the dead: Haere, Haere te mana, te nui,</i>	Iwi: Ngāti Naho, Ngāti Tipa- Ngāti Pāoa. Takiwā: Maramarua. Ahunga: Cowan, 1987, pp. 226-228. Legends of the Māori, Vol 1. Kaikōrero: Tohikuri

	<p><i>haere, e Maunga-roa. Haere! Haere!” “Farewell! Depart the powerful, the great, farewell, O Tall-Mountain. Depart, depart!”</i></p> <p>Tohikuri also stated that Maungaroa is also a maunga-tohu-ua or a mountain that indicates when rain will fall. Small clouds seem to gather from the west upon the summit of Maungaroa.</p>	
<p>MAUNGA-HIKONGA-ŪIRA –</p> <p>Lightning bolts striking mountaintops</p>	<p>MOEHAU¹⁷⁸: 892m. Well known haunt of Ngāti Kōrakorako, Ngāti Tūrehu, Ngāti Patupaiarehu. Sacred mountain of Ngāti Tamaterā. A downward flash of lightning upon the summit known as a maunga-hikonga-ūira of Te Moenga-i-haua-e-Poutama is a sign of the death of someone significant in the tribe.</p>	<p>Iwi: Ngāti Pare-wahaika- Ngāti Tamaterā.</p> <p>Takiwā: Te Tara-o-Te-Ika.</p> <p>Ahunga: Cowan, 1930, p. 215; Cowan 1987, p. 226.</p> <p>Kaikōrero: Ngākoma Ngāmane.</p>
<p>MAUNGA-HIKONGA-ŪIRA –</p> <p>Lightning bolts striking mountaintops</p>	<p>PŌTIKI-O-REHUA: 492m. Located above the Paeroa Racecourse. Below this peak is a bluff known as Ngāwhakaripanga or Black Rock. Burial caves are located here. When lightning struck the peak everyone knew that one of the senior members of Ngāti Kiriwera was about to die.</p>	<p>Iwi: Ngāti Kiriwera-Ngāti Tamaterā.</p> <p>Takiwā: Taumaharua – Ōhinemuri.</p> <p>Kaikōrero: Ahiataewa Te Roera, Huhurere Tukukino.</p>
<p>MAUNGA-HIKONGA-ŪIRA –</p> <p>Lightning bolts striking mountaintops</p>	<p>KOHUKOHUNUI: 688m located on the Hunua Range</p>	<p>Iwi: Ngāti Pāoa, Ngāi Tai, Ngāti Whanaunga.</p> <p>Takiwā: Hūnua, Wharekawa.</p> <p>Kaikōrero: Tukumana Te Taniwha.</p>

¹⁷⁸ Known also as Te Moenga-i-haua-e Poutama, and Te Moenga-hau-a-Tama-te-kapua.

MAUNGA- HIKONGA-ŪIRA – Lightning bolts striking mountaintops	RĀTĀROA: 325m near Waitakaruru, Pūkorokoro	Iwi: Ngāti Horowhenua-Ngāti Pāoa, Ngāti Hako, Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki. Takiwā: Waitakaruru. Kaikōrero: Tomo Baggs.
MAUNGA- HIKONGA-ŪIRA – Lightning bolts striking mountaintops	TE AROHA: 953m high. Known dwelling place of Patupaiarehe	Iwi: Marutūahu whānui. Takiwā: Te Aroha. Kaikōrero: Taimoana Tūroa.
TOTAL - 6		

Hauraki interviewees explained that in their view, when unusual weather phenomena ‘acted up’ on their sacred maunga, you should pay attention. Locals tended to be more wary and cautious going about their business. Taimoana Tūroa explained that: *“The whenua, the awa, the moana and the wāhi tapu reflected the health and well-being of the whānau, hapū and their iwi”*. He also explained that Hauraki rangatira were buried in caves and crevasses, and because of this, mountains like Moehau were viewed with awe and reverence by Hauraki iwi (Tūroa, 1982). The whakapapa connection between Hauraki iwi and the natural environment forms the very core of Hauraki identity.

3. Ngā Maumaharatanga – Memory Techniques

Usually memory techniques were used as a mechanism to remember complex information or to ensure that lessons, usually ones that involved fatalities, were not forgotten. Common memory techniques used by Hauraki iwi include place names, whakataukī and waiata tangi.

Whakataukī – Tribal Proverbs

As explained in the previous chapter, whakataukī were and still are an excellent tool to check irregular behaviour, especially when it involves ‘te ao wairua’. Tohunga kōkōrangi were trained to understand the numerous tohu above in order to understand what potentially could impact upon their settlements. Those who refused to heed the

instructions of tohunga kōkōrangī like Wharewharengāterangi from Ōhinemuri, Ngāti Kāhuiārīki – Ngāti Hako, did so at their peril.

TĒPU 7.2: NGĀ WHAKATAUKĪ – TRIBAL PROVERBS

NGĀ WHAKATAUKĪ	NGĀ TIKANGA	IWI TAKIWĀ AHUNGA KAIKŌRERO
TRIBAL PROVERBS	MEANING	TRIBE AREA SOURCE INFORMANT
E kore a Whare e taputapu, he ua haere mai roto i Keteriki – <i>Whare will not chant an incantation to stop the rain for it comes from the direction of Keteriki.</i>	A flood was threatening a village located at the juncture between Ōhinemuri and the Waihou River. Whare, the renowned Ngāti Hako tohunga, refused to utter a karakia to protect the kāinga as he explained that when the wind blows from Keteriki, expect potential flooding to occur	Iwi: Ngāti Hako. Takiwā: Ruawehea-Ōhinemuri. Ahunga: Mead & Grove, 2001, p. 31.
E kore Whare e tāna, he ua haere mai i roto i Keteriki – <i>Whare won't do it, won't stop the rain coming from Keteriki.</i>	The high priest and chief of Ngāti Hako Wharewharenga-te-rangi was slighted by his people for not digging as fast as he could as they were digging the maioro (earthworks) of the pā. Whare's sister heard some of her people mutter, "His feet appeared as tender as pigeon feathers, and that for fear of breaking them, he would not use his strength", so she told Whare what they had said. Knowing well in advance by the signs of the cloud formations that a marangai (rainstorm) was about to strike the Ōhinemuri, Whare built a kāuta (cooking shed) for him and his sister and within four days, he filled it with roi (fernroot). As the heavy rain took most of Whare's people by surprise, they were unable to cook food, and therefore wanted	Iwi: Ngāti Hako Takiwā: Ruawehea-Ōhinemuri Ahunga: Riley, 2013, p. 71.

	<p>some of his roi. Whare gave this answer which became a proverb. Another version of this proverb says that as the chief and the tohunga of the tribe, Whare was asked to recite a karakia to stop the flooding. Knowing that the prevailing weather came from the south and that the Keteriki catchment near Te Aroha would send flood waters from that way each year at that time, he realised the futility of intoning a karakia for this purpose and refused to grant their request.</p>	
<p>Me haehaetia koia te rau i peke i te matangi – <i>Should the shrivelled leaf be broken by the wind.</i></p>	<p>Ngapuhi failed to take Te Totara Pā so Hongi Hika made peace. After departing on their waka he commanded the Ngapuhi flotilla to pull over at Tararu with the intention of returning and surprising the pā. Only Whetoi Pomare and his people refused to support this treacherous action. Hongi's deceitful action succeeded.</p>	<p>Iwi: Ngāpuhi vs Marutūāhu whānui Takiwā: Te Tōtara. Ahunga: Mead & Grove, 2001, p. 293.</p>
<p>E Whare e! Tarā te rangi kia mao ai – <i>Oh Whare! Raise your voice and repeat your charms in a loud voice to the sky and make the rain cease.</i></p>	<p>The Ngāti Hako tohunga and chief, Wharewharenga-te-rangi was unable to complete his ritual as his people refused to provide him with special food and prepare the ovens as required. This was a grave offence. He immediately invoked the gods to punish them for their disobedience. As he stood upon the summit of Taumaharua, the skies opened and the great deluge that</p>	<p>Iwi: Ngāti Hako. Takiwā: Ruawehea-Ōhinemuri. Ahunga: Mead & Grove, 2001, p. 293.</p>

	<p>followed engulfed the homes and the cultivations of his people on the river flats below. The people became distraught and implored him to take pity and cease his actions. He steadfastly refused, stating that once the plug of the waters of Keteriki, a small peak near Te Aroha, was vented; the flow was impossible to stop until its waters had emptied. This caused widespread devastation to villages and crops below.</p>	
<p>He iorangi kei runga Moehau, Te Tara-o-Te-Ika, he rā paki āpōpō - <i>A cirrus cloud on Moehau, along the Coromandel Ranges, fine day tomorrow.</i></p>	<p>Ngāti Pare proverb. Cirrus clouds are very high, wispy clouds, like Mares tails.</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.</p>
<p>Ka ahu atu te pūkeko ki ngā hiwi, ka waipuke te whenua - <i>When the pūkeko heads for higher ground, it will flood.</i></p>	<p>Ngāti Tamaterā lived extensively throughout the Parehauraki region. Many of its traditional settlements were located in the Ōhinemuri area and across the vast swamplands of the Hauraki plains and along the west coast of Te Tara-o-Te-Ika (Coromandel Peninsula). This iwi got to observe the wild life located within these swamps. Over time they came to understand the seasonal changes of their environment, and climatic impacts on low lying settlements, especially during the wet, cold winter months. The pūkeko was just one biological indicator that they took notice of to minimise</p>	<p>Iwi: Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.</p>

	any chances of harm or danger to their hapū.	
<p>Karapotitia ana te rā ki te āwheo mārama, te rā rānei, he āwhā e tata mai ana. Karapotitia ana te rā, te marama rānei ki te āwheo hinapōuri, he āwhā kei tua noa atu - <i>A complete, vivid halo around the moon or sun, bad weather expected. A pale and dim halo encircling the sun or moon, a storm is far off.</i></p>	<p>Marutūāhu observation. The thicker and more pronounced the halo, the closer the bad weather is. Approximately 3-4 days before the arrival of bad weather.</p>	<p>Iwi: Ngāti Pāoa, Ngāti Hako, Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki.</p> <p>Takiwā: Kerepēhi, Ōhinemuri – Hauraki.</p> <p>Kaikōrero: Tomo Baggs.</p>
<p>Ka tangi te kākā, ā, ka kitea i a ia e rere takahurihuri ana i runga i te ngahere, he āwhā nūnui kei te haere - <i>When a kākā cries, and it is seen twisting and turning above the forest canopy, a violent storm is on its way.</i></p>	<p>Ngāti Pāre-wahaika – Ngāti Tamaterā proverb. Kākā are native parrots that used to be seen in frequent numbers on the Moehau Peninsula. When Ngāti Pare elders saw the kākā acting up, screeching and flying above the forest canopy and the ridge lines of Te Tara-o-Te-Ika, they knew that a weather bomb would hit the Coromandel Coast in 6-8 hours. They only had a short period of time to prepare so that they would survive the impending storm. Ngāti Toa Rangatira and Te Ātiawa look for this same indicator on Kapiti Island. When they see the kākā playing up above the canopy they know that if they need to get across to the mainland they have only a short window before the moana is too rough to do so.</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Kaikōrero: Te Hiringānuku Ngāmane.</p>

<p>Ka tangi te pīpīwharaua, koekoeā, me te kūaka, he tohu ka mahana haere ngā rangi, ā, he tohu hoki kua tae mai a Koanga - <i>When the pīpīwharaua, the koekoeā and the kūaka are heard crying, it is a sign the days will get warmer, and it is also a sign that Spring has arrived.</i></p>	<p>Ngāti Pare would wait and watch out for the arrival of the pīpīwharaua and the koekoeā. Ngāti Pāoa would wait for the arrival of literally hundreds of thousands of kūaka to feed on the mud flats of Tikapa Moana near Waitakaruru and Pūkorokoro. The arrival of these migratory birds heralded the beginning of Spring, meaning warmer and calmer weather.</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.</p>
<p>Kei te rangona te kāhui ruru e tiwaha mai ana i te pō, he ua kei te haere mai - <i>When the shrill cries of Ruru (morepork) are heard at night, rain is expected.</i></p>	<p>Successive calls of the morepork at night meant rainfall to the Ngāti Pare hapū of Ngāti Tamaterā. Ngāti Tahu also have a similar forecast for ruru. Repeated cries through the night mean bad weather is expected. But if one or more answering calls occur throughout the night, a storm is imminent.¹⁷⁹</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.</p>
<p>Ngā āhua, ngā tae o ngā kapua o runga o Moehau, me Te Aroha, he ua, he hau, (he paki o Hewa) me te hukarere - <i>The shapes and colours of medium to low clouds in the sky and above (local mountains) Moehau and Te Aroha Mountain. When these clouds settle on the peaks, rainfall; winds (calm periods, squalls, etc) and snow can be expected.</i></p>	<p>A Ngāti Pare observation. Traditionally local mountains, especially significant, iconic sacred mountains were revered by hapū and iwi. Te Hiringa-nuku's father, Ngākoma would always check Te Moenga-i-haua-e-Poutama (Moehau Mountain) to ascertain what the weather would be like.</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.</p>
<p>Ua kōwhai - <i>Kōwhai showers.</i></p>	<p>A Marutūāhu weather proverb. Light spring showers were known</p>	<p>Iwi: Ngāti Pāoa, Ngāti Whanaunga.</p>

¹⁷⁹ Best, 1994, p. 409

	as “ua kōwhai”, as the flowers of the kōwhai had finished blooming and had started to fall. Ngāti Pāoa, Ngāti Whanaunga kaumatua, Haumarangai Conner explained this tohu, “kōwhai rains”. These are rains that are expected to fall during the time the flowers of the kōwhai start to fall to the ground, which is around September. It is also known to be windy during this period.	Takiwā: Kerepēhi, Te Tara-o-Te Ika. Kaikōrero: Haumarangai Conner.
TOTAL: 12		

Ngā Wāhi Ingoa - Place Names

There are many place names in Hauraki that either caution people to beware, or are associated with local weatherlore in some way. Tēpu 7.3 is a list (not comprehensive) of Hauraki place names with their respective meanings, iwi and location.

TĒPU 7.3: NGĀ WĀHI INGOA – PLACE NAMES

NGĀ WĀHI INGOA PLACE NAMES	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO TRIBE AREA SOURCE INFORMANT
AONGĀTETE	‘Moving cloud’. Located 26 kms south of Waihi.	Iwi: Ngāti Tamaterā. Disputed boundaries. Takiwā: Hauraki-Te Puna Katikati. Ahunga: Reed, 2002, p. 15.
AORANGI	‘Bright Sky’. A hill located south of the Paeroa Racecourse.	Iwi: Ngāti Tamaterā, Ngāti Hako, Ngāti Tara Tokanui Tāwhaki. Takiwā: Ōhinemuri-Paeroa. Kaikōrero: Tomo Baggs.
AOTEA Great Barrier Island	‘The island enveloped in white clouds’. Describes how clouds seem to gather around this island.	Iwi: Ngāti Rehua-Ngāti Wai, Marutūāhu whānui.

		<p>Takiwā: Ngā Poitō-o-Te-Kūpenga-o-Taramainuku.</p> <p>Map ref: S08: 276543.</p> <p>Ahunga: Tūroa, 2000, p. 81.</p>
<p>HAUKAPUA</p> <p>Torpedo Bay - Devonport</p>	<p>Known as Torpedo Bay, its translation here is given as ‘wind scoop’. The area caught the easterly sea winds and gave shelter to inner harbour waters. ‘Cloud bank carried above the wind’ is another translation of this name. The Tainui waka landed at Te Haukapua (Torpedo Bay) near North Head in Tāmaki before going up the Tāmaki River and crossing over the isthmus into the Manukau Harbour.</p>	<p>Iwi: Ngāti Pāoa-Marutūāhu whānui.</p> <p>Takiwā: Waitematā-Tāmaki.</p> <p>Ahunga: Simmons, 1987, pp. 3, 13.</p>
HAURAKI	<p>‘The arid north wind’. Refers to the whole rohe of Hauraki from Matakana to the north to Matakana Island to the south east.</p>	<p>Iwi: Marutūāhu-Kōwhao-rau.</p> <p>Rohe: Mai Matakana ki Matakana.</p> <p>Ahunga: Tūroa, 2000, p. 84.</p>
HAUTAPU	<p>‘Sacred wind’. Burial caves and also a site of a pā located south of Papaaroha. North of Coromandel.</p>	<p>Iwi: Ngāti Tamaterā.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Kaikōrero: Tewi Nicholls.</p>
KOHUKOHUNUI	<p>‘The great misty mountain’, it stands as the highest peak in the Hunua Ranges associated with Ngāti Whanaunga, Ngāti Pāoa and Ngāi Tai.</p>	<p>Iwi: Ngāti Whanaunga, Ngāti Pāoa, Ngāi Tai.</p> <p>Takiwā: Hūnua.</p> <p>Map ref: S11: 078603.</p> <p>Ahunga: Tūroa, 2000, p. 97.</p>
MĀTAI WHETŪ	<p>‘The observation place of the stars’. This headland commands panoramic views, a site perfect to observe not only the stars rising from the east and setting to the west, but also the daily condition of the weather.</p>	<p>Iwi: Ngāti Maru.</p> <p>Takiwā: Kōpū-Kirikiri.</p> <p>Map ref: T12: 388426.</p> <p>Ahunga: Tūroa, 2000, p. 106.</p>
<p>MAUMAUPAKI</p> <p>Mt Camel</p>	<p>‘The mountain that entraps fair skies’. The summit of Maumaupaki has a</p>	<p>Iwi: Ngāti Tamaterā.</p> <p>Takiwā: Te Tara-o-Te Ika.</p>

	<p>distinctive double humped peak.</p> <p>When the sun rises some mornings on a clear day, the sun would look like it was trapped between the horns of Maumaupaki.</p>	<p>Map ref: T11: 398669.</p> <p>Ahunga: Tūroa, 2000, pp. 162-163.</p>
<p>MOTUKOREHA¹⁸⁰</p> <p>Browns Island</p>	<p>‘Island sinking out of sight’. In certain weather conditions Motukoreha seems to disappear or appear to be suspended above the moana when viewed from a distance. This tohu indicated that bad weather was expected from the east.</p>	<p>Iwi: Marutūāhu whānui.</p> <p>Takiwā: Te Moana-tīkapakapa-o-Hauraki.</p> <p>Ahunga: Simmons, 1987, p. 73.</p>
<p>MOTUTERE</p>	<p>‘The floating island’. Tamatekapua’s son Kahumatamomoe climbed the 532m maunga falling asleep once he had reached the top. When he awoke he felt like he was floating on top of the clouds.</p>	<p>Iwi: Ngāti Maru, Ngāti Whanaunga, Ngāti Pūkenga.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Map ref: T11: 394828.</p> <p>Ahunga: Tūroa, 2000, p. 118.</p>
<p>MOTUTOHUHAU</p>	<p>‘Island indicating the wind to come’, a pā of Ngāti Tamaterā and Ngāti Pāoa on Motukoreha Island.</p>	<p>Iwi: Ngāti Tamaterā.</p> <p>Takiwā: Te Moana-tīkapakapa-o-Hauraki.</p> <p>Ahunga: Simmons, 1987, p. 73.</p>
<p>NGĀ KURĪ-A-WHĀREI</p>	<p>‘The dogs of Whārei’. When the locals heard the strange noise like the low growling noises of dogs, they knew that a storm will be striking the coast within 4-6 hours. The rolling swells would force the air between the holes within the submerged reef causing the weird sound.</p>	<p>Iwi: Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki, Ngāti Hako.</p> <p>Takiwā: Waihi.</p> <p>Map ref: U13: 762167.</p> <p>Ahunga: Tūroa, 2000, p. 120.</p>
<p>NGĀ TUAITARA-A-TAIKEHU</p>	<p>‘The dorsal fins of Taikehu’. The three peaks of Rangitoto. Taikehu was an</p>	<p>Iwi: Marutūāhu whānui.</p>

¹⁸⁰ Mainly known as Motukorea (Tūroa, 2000)

	important tohunga who came across on the Tainui waka. He settled in Tāmaki. Local Māori would keep an eye out if mists clung to the peaks, rain was imminent; if clear, continued fine weather was expected. Also known as Ngā Tuaitara-a-Tohuhau and Ngā Pona-a-Peretū.	Takiwā: Te Moana-tīkapakapa-o-Hauraki. Ahunga: Simmons, 1987, p. 87.
OPAKETAI	‘Place of driftwood’. Located at Birkdale Landing at the end of Beach Haven Road. Driftwood seen along the beach here indicates westerly weather.	Iwi: Marutūāhu whānui. Takiwā: Waitematā. Ahunga: Simmons, 1987, p. 75.
ŌRONGO	‘A listening post’. The southern shoreline of Tīkapa Moana was a rich feeding ground for kūaka, which migrated from Alaska. Snarers of these birds could predict nearly down to the day when they would arrive.	Iwi: Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki. Takiwā: Waihou ki te uru (west bank of the Waihou River). Map ref: T12: 340440. Ahunga: Tūroa, 2000, p. 128.
PĀ-TE-TONGA	‘Wind prevailing from the south’. A pā located in the hills of the Hapu-a-Kohe Ranges exposed to the cold southerly wind, which would blow from time to time.	Iwi: Ngāti Tamaterā, Ngāti Pāoa, Ngāti Hako, Ngāti Maru. Takiwā: Waikākā. Map ref: S13: 287195. Ahunga: Tūroa, 2000, p. 133.
RANGIHAU	‘Windy skies’. Located north of Te Kōwhatu-whakairi-o-Ngātoroirangi or more commonly known as Table mountain.	Iwi: Ngāti Maru. Takiwā: Kauaeranga Ahunga: NZ Topo Map.
RANGITOTO	‘The blood reddened sky’. Describes the time when the sky became a blood-red colour due to the eruption causing a new island to be formed in Tīkapa Moana. Many of the	Iwi: Ngāi Tai, Ngāti Pāoa. Takiwā: Waitematā-Tāmaki. Map ref: R11: 763887. Ahunga: Tūroa, 2000, p. 142.

	<p>surrounding islands names reflect the day it erupted, causing the sun to be obscured (Rā-kino) which caused the day to lengthen (Rā-tō-roa), including darkness (Pō-nui). The full name is: “Te Rangi-i-totongia-te-ihu-o-Tama-te-kapua”, “The day Tama-te-kapua’s nose bled”. Coincidence maybe that Tamatekapua (Te Arawa waka) and Hoturoa (Tainui waka) came to blows about the time that Rangitoto exploded?</p>	
REPANGA	<p>‘Covering the sea as a cloak’. Ngātoroi-rangi the celebrated tohunga of Tainui and Te Arawa waka released two sacred birds (tieke-saddlebacks) called Takareko and Mumuhau who could predict stormy weather conditions. Local Māori fishers always kept a wary eye on Repanga especially if the tohu forecasted an easterly storm.</p>	<p>Iwi: Ngāti Tamaterā, Ngāti Hei, Ngāti Whanaunga. Takiwā: Hauraki. Ahunga: Tūroa, 2000, pp. 144-145.</p>
RONGOHAU	<p>‘Nook sheltered from the wind’. At Kauri Pt, near Te Matarae-o-Mana, a sheltered bay for waka crew experiencing rough weather. Pākeha name for this bay is Kendall Bay.</p>	<p>Iwi: Marutūāhu whānui. Takiwā: Waitematā. Ahunga: Simmons, 1987, p. 83.</p>
ROKOKOHU	<p>‘Lake of mist’. Rotokohu was a settlement area for the people of Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki.</p>	<p>Iwi: Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki. Takiwā: Ruawehea, Ōhinemuri. Ahunga: Tūroa, 2000, p. 97.</p>
TAUMAHARUA	<p>‘The hill of ancient invocations’. Location of an ancient whare wānanga of Ngāti Hako that was supported by</p>	<p>Iwi: Ngāti Hako, Ngāti Tamaterā.</p>

	<p>Rakataura (also known as Hape) the Tainui tohunga who married Hako I daughter, Te Kukuti-o-te-rangi.</p> <p>Wharewharengā-te-rangi, a great-grandchild of Rakataura was, like his tūpuna, a matakite, a skilled tohunga kōkōrangi, an expert in not only star divination and forecasting the weather, but could raise or calm storms. Taumaharua is a 492m high peak with commanding 360 degree views of the Hauraki Plains below, all the way to the sea coast to the east.</p>	<p>Takiwā: Ruawehea, Ōhinemuri.</p> <p>Map ref: T13: 505228.</p> <p>Ahunga: Tūroa, 2000, p. 149.</p>
<p>TE HAUTURU-O-TOI</p> <p>Little Barrier Island</p>	<p>‘Wind standing up’, ‘Resting place of lingering breeze of Toi’. The famous Polynesian voyager, Toi observed a cloud over the summit of the mountain which stands at its highest peak at 722m.</p>	<p>Iwi: Marutūāhu whānui.</p> <p>Takiwā: Ngā Poitō-o-Te-Kūpenga-o-Taramainuku.</p> <p>Map ref: SO8: 974538.</p> <p>Ahunga: Tūroa, 2000, p. 85.</p>
<p>TE PUNA-RERE-A-MARUTOHUHAU</p>	<p>‘The flowing spring of Maru’. If this puna flowed excessively during spring weather, the expected outcome was a fruitful year.</p>	<p>Iwi: Marutūāhu whānui.</p> <p>Takiwā: Te Moana-tīkapakapa-o-Hauraki.</p> <p>Ahunga: Simmons, 1987, p. 81.</p>
<p>TIRITIRI-O-MATANGI</p>	<p>‘The sanctified heaven of fragrant breezes’. An island located to the east off the Whangaparāoa Peninsula. Totally exposed to the prevailing winds from the west. An ancient place name originating from Hawaiki. The island appears to move and appear in different places.</p>	<p>Iwi: Ngāti Pāoa.</p> <p>Takiwā: Ruawehea, Ōhinemuri.</p> <p>Map ref: R10: 794097.</p> <p>Ahunga: Tūroa, 2000, p. 187.</p>
<p>TOREHINA</p>	<p>‘The grey haired pubes’. A 300m high hill located near Waitete Bay. The</p>	<p>Iwi: Ngāti Tamaterā, Patukirikiri.</p> <p>Takiwā: Te Tara-o-Te Ika.</p>

	place name is a metaphor referring how mist clings to the hill slopes.	Map ref: T12: 287002. Ahunga: Tūroa, 2000, p. 188.
WAIKINO	‘Harmful waters’. The narrow passage is known to cause a raging torrent of destruction. Waikino was also the name of a taniwha that inhabited the depths of the river. A settlement 5km west of Waihi, Waikino is located by the banks of Te Waitangi o Hinemuri (Ohinemuri River) where flooding occurs regularly.	Iwi: Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki, Ngāti Hako. Takiwā: Karanga-a-Hape. Map ref: T13: 556177. Ahunga: Tūroa, 2000, p. 198.
TOTAL - 27		

Many of these places are located by waterways or near the moana as a reminder to local Māori to be forever vigilant about storms that might appear suddenly. Knowing how to speak Te Reo Māori is vitally important to appreciate the nuance, layers and the depth of understanding these place names carry, and their warnings to remain cautious. However, the inability of the majority of Hauraki Māori these days to speak and therefore understand Te Reo Māori, places them at a distinct disadvantage.

4. Ngā Whakarōpūtanga - Nomenclature and Classification

Consistent response to questions regarding the names and types of wind, rain and cloud were unsurprisingly sparse. This explains why I have had to source information from literature such as Ngā Mōteatea (Ngāta, 2007) to help populate the following tables.

Ngā Momo Ua – Rain Classification

When asked if participants had noticed any marked changes in weather and climate conditions during their lifetime, the general consensus of all the interviewees was that only than experiencing warmer temperatures, the frequency of heavy rainfall seems to be on the rise. Betty Williams (2012) stated that in the last 2-3 years she had observed more than 16 slips or scars within the Manāia Harbour due to heavy rain. The time of

the year that these types of heavy rains or marangai occur are known locally as ‘kōwhai rains’, which start in early September¹⁸¹.

Here in Tēpu 7.4 a number of rain classifications is presented along with their meanings. The majority of the names are sourced from kaumatua and Ngā Mōteatea (2007).

TĒPU 7.4: NGĀ MOMO UA – RAIN CLASSIFICATION

NGĀ MOMO UA RAIN CLASSIFICATION	NGĀ TIKANGA MEANING DESCRIPTION	IWI TAKIWĀ AHUNGA KAIKŌRERO TRIBE AREA SOURCE INFORMANT
ĀWHĀ Violent storm	Extreme weather event, weather bomb. The top half of Te Tara-o-Te-Ika is susceptible to violent storms.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Kaikōrero: Te Hiringānuku Ngāmane.
MARANGAI Heavy, torrential downpour	Heavy rainfall associated with an easterly	Iwi: Ngāti Whanaunga. Takiwā: Manāia. Kaikōrero: Toko Renata.
UA Generic name for rain	Rainfall	Iwi: Ngāti Kiriwera-Ngāti Tamaterā. Ahunga: Ngā Mōteatea IV – Ngata, 2007, pp. 288-289. Waiata No.373: He waiata. Line No.1. Example: E ua rā e te ua, tātarahi ana koe i runga rā – <i>Let it fall, oh rain, shower down from above.</i> Kaitito / Kaikōrero: Powhiri.
UA-KŌPATAPATA Light rain	Falling in heavy drops.	Iwi: Ngāti Tamaterā, Marutūāhu whānui. Takiwā: Ōhinemuri, Te Puru. Kaikōrero: Taimoana Tūroa.
UA-KŌWHAI September rains	When the kowhai flowers begin to fall, the September rains are expected. This is	Iwi: Ngāti Pāoa, Ngāti Whanaunga. Takiwā: Kerepēhi, Manāia.

¹⁸¹ See Tēpu 7.8: tohu āhuarangi or climate tohu for ‘kōwhai rains’

	<p>also an indicator that Spring has come.</p> <p>Ka tipu ko tāna, nō te mea i a ia te mōhiotanga ki te kōwhai, hei tohu mō tāna -</p> <p><i>The time when the kowhai flowers are used as a metaphor for Spring; the “kowhai rains” are at the spring equinox.</i></p>	<p>Kaikōrero: Haumarangai Conner.</p>
<p>UA-WHATU</p> <p>Hail stones</p>		<p>Iwi: Ngāti Tamaterā, Marutūāhu whānui.</p> <p>Takiwā: Ōhinemuri, Te Puru.</p> <p>Kaikōrero: Taimoana Tūroa.</p>
TOTAL - 6		

Ngā Momo Hau o Hauraki

The Manāia Harbour is orientated along a west-east direction. According to Ngāti Whanaunga kaumatua, Toko Renata (2012), the iwi (Ngāti Pūkenga, Ngāti Tamaterā, Ngāti Maru and Ngāti Whanaunga) located within the kōawaawa¹⁸² of Manāia are sheltered from any southerlies due to the Pukewhakataratara range running towards the Hauturu peak to the southeast. Naturally when a marangai or easterly wind blew during the early morning, fishing crews wanting to get out on to Tīkapa Moana would use the marangai to get them out past the heads and out to the fishing grounds. These same fishing crews would watch out for the wind to shift around to the northwest to take them back to Manāia. This is one of the characteristics of the norwester. It is a blustery, chilly wind that blows straight into the Manāia community. North-easterlies were responsible for causing the most extreme weather events in Manāia. Locals know that you can experience fine weather down on the flood plain, and still be flooded out. Locals would hear the roar of the Manāia River further up the catchment, a sign that it was raining heavily on the ranges above.

¹⁸² Valley

Ngāti Pare kaumātua Te Hiringānuku spoke of other local knowledge to understand some of the environmental nuances of Te Ūmangawhā. This included, like Toko Renata, an acute awareness of the winds, which was particularly important for safe and successful fishing activities. Te Hiringānuku recalled the terminology for different clouds and the direction of winds at Te Ūmangawhā: northerly winds (hauraki), easterly winds (haumarangai), southerly winds (hautonga) and westerly winds (hauāuru).

In Tēpu 7.5 the number of wind names (28) collated took me by surprise. The majority of the wind names are sourced from the Hauraki tohunga, Tīwai Paraone. Many Hauraki kaumātua, when asked if they knew of any names for tornadoes or whirlwinds in their dialect stated that although violent storms are happening more often, whirlwinds are still rarely seen. Ironically I was able to identify six types of violent storms. Some of these winds have an esoteric ‘feel’ to the name, which possibly means that there needs further research to understand what that might mean. Identifying waiata tawhito¹⁸³ from Hauraki in the Ngā Mōteatea series has been an invaluable literary source for different wind types including other weather phenomena.

TĒPU 7.5: NGĀ MOMO HAU – WIND CLASSIFICATION

NGĀ MOMO HAU WIND CLASSIFICATION	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO TRIBE AREA SOURCE INFORMANT
APŪ-TAI	Billowing, gusting wind off the moana.	Iwi: Marutūāhu whānui. Ahunga: Wakareo. Hei tauira: Nā te apu tai koe i tukituki ki roto o Hauraki.
ĀWHIORANGI	The whirlwinds of heaven. Sourced from Tīwai Paraone transcript. His classification of the different winds is similar to Ngāti Maniapoto.	Iwi: Ngāti Pāoa, Marutūāhu whānui. Takiwā: Kerepēhi, Wharekawa. Ahunga: Paraone, 1907, pp. 12, 16.
ĀWHIOWHIO	Whirlwind. Rarely seen.	Iwi: Ngāti Tamaterā, Ngāti Whanaunga, Ngāti Pāoa. Rohe: Hauraki.

¹⁸³ Ancient traditional song

		Kaikōrero: Tewi Nicholls, Toko Renata, Haumarangai Conner.
HAUĀRAKI-URU	North-westerly wind. Usually a strong, blustery wind coming off the moana.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
HAUĀURU	Westerly wind	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
HAUĀURU-O-TE-TONGA	South-westerly wind	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
HAUĀURU-TŪPOKI	West wind	Iwi: Ngāti Pāoa, Marutūāhu whānui. Takiwā: Kerepēhi, Wharekawa. Ahunga: Paraone, 1907, pp. 12, 16.
HAU-MARANGAI	North-easterly winds	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru, Ngāti Pāoa, Ngāti Whanaunga, Ngāti Pūkenga. Takiwā: Te Tara-o-Te Ika. Kerepēhi, Manāia. Ahunga: Lionel Richards, John Tūhoe. Kaikōrero: Te Hiringānuku Ngāmane, Haumarangai Conner.
HAU-O-TE-TONGA	South wind	Iwi: Ngāti Kahuwhitikī, Ngāti Tamaterā. Ahunga: Ngā Mōteatea IV – Ngata, 2007, pp. 94-95.

		<p>leader. The mana of Te Whata-angaanga was assumed by his second eldest son, Tokoahu.</p> <p>Hei tauira: Tāmia atu ana he hau tāmīrua te tai – <i>Then pressed down, and the tide repressed by the wind.</i></p> <p>Kaitito / Kaikōrero: Te Popo.</p>
HAU-TONGA	South wind	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Kaikōrero: Te Hiringānuku Ngāmane.</p>
HAU-WAHO-O-TE-TONGA	South-easterly winds	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Kaikōrero: Te Hiringānuku Ngāmane.</p>
KARUIA	North-easterly wind	<p>Iwi: Ngāti Pāoa, Marutūāhu whānui.</p> <p>Takiwā: Kerepēhi, Wharekawa.</p> <p>Ahunga: Paraone, 1907, pp. 12, 16.</p>
MĀKOIRANGI	Destructive wind	<p>Iwi: Ngāti Pāoa, Marutūāhu whānui.</p> <p>Takiwā: Kerepēhi, Wharekawa.</p> <p>Ahunga: Paraone, 1907, pp. 12, 16.</p>
MARANGAI	<p>Easterly wind. Heavy rainfall associated with an easterly.</p> <p>Causes the Manāia Harbour to be stirred up. Possible flooding across the road.</p>	<p>Iwi: Ngāti Pāoa, Marutūāhu whānui</p> <p>Takiwā: Kerepēhi, Wharekawa</p> <p>Ahunga: Paraone, 1907, pp. 12, 16.</p> <p>Kaikōrero: Toko Renata Te Taniwha.</p>

MATANGI	Breeze	<p>Iwi: Ngāti Tamaterā, Marutūāhu whānui.</p> <p>Takiwā: Hauraki.</p> <p>Kaikōrero: Taimoana Tūroa.</p>
PŪWHAKARERE-I-WAHO	Destructive wind	<p>Iwi: Ngāti Pāoa, Marutūāhu whānui.</p> <p>Takiwā: Kerepēhi, Wharekawa.</p> <p>Ahunga: Paraone, 1907, pp. 12, 16.</p>
RIPO-HAUĀURU	Wind currents from the west	<p>Iwi: Ngāti Kahuwhitiki-Ngāti Tamaterā</p> <p>Ahunga: Ngā Mōteatea IV – Ngata, 2007, pp. 94-95.</p> <p>Waiata: 325 He whakautu tautitotito.</p> <p>Rārangi: 3.</p> <p>Hei tauira: Riro te whakaaro ki ngā hau o te tonga, ripoa mai nei he ripo hauāuru – <i>Reflective thoughts are gone with the south wind, Whirling about are these currents from the west.</i></p> <p>Kaitito / Kaikōrero: Tokoahu.¹⁸⁵</p>
TE HAU-O-TĀWHIRIMĀTEA	The Wind of Tāwhirimātea	<p>Iwi: Ngāti Whanaunga.</p> <p>Takiwā: Manāia.</p> <p>Kaikōrero: Toko Renata.</p>
TIRITIRI-O-MATANGI	The Sanctified Heaven of Fragrant Breezes	<p>Iwi: Ngāti Tamaterā-Marutūāhu whānui.</p> <p>Rohe: Hauraki whānui.</p> <p>Ahunga: Tūroa, 2000, p. 187.</p>
TONGA	Southerly	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Te Tara-o-Te Ika.</p>

¹⁸⁵ My sixth great grandfather

		Kaikōrero: Te Hiringānuku Ngāmane.
TONGA-NUI	South wind	Iwi: Ngāti Pāoa, Marutūāhu whānui. Takiwā: Kerepēhi, Wharekawa. Ahunga: Paraone, 1907, pp. 12, 16.
TŪARAKI	North wind	Iwi: Ngāti Pāoa, Marutūāhu whānui. Takiwā: Kerepēhi, Wharekawa. Ahunga: Paraone, 1907, pp. 12, 16.
TŪ-AWHIONUKU	Whirlwind	Ahunga: Maori Religion and Mythology: Shortland, 1882, p. 13.
TŪ-AWHIORANGI	Whirlwind	Ahunga: Shortland, 1882, p. 13.
WINI	Breeze	Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 58-59. Waiata.109: He waiata aroha. Rārangi: 8. Hei tauira: Ko te mātao rā, i tope i raro rā he wini tukunga mai nōu rā, e te hoa – <i>A numbing cold I feel below from the breeze blowing hither, O my mate.</i> Kaitito: Unknown.
TOTAL - 28		

Clouds are embedded in the psyche of the iwi. The signature Hauraki pepeha reflects this:

“Ngā puke ki Hauraki ka tarehu, e mihi ana ki te whenua, e tangi ana ki te tangata” – “The peaks of Hauraki are shrouded in clouds and mist, acknowledging the land, and grieving for those who have passed on”

The ability of Hauraki iwi to identify the different cloud types were very important as some clouds acted as an indicator for more dangerous and potentially threatening storm

systems. Certain clouds were carefully observed especially if they got bigger, darker and flattened off at the top. Clouds known as `Potae'¹⁸⁶ gathered on the peaks of Te Aroha all the way along Te Tara-o-te-ika¹⁸⁷ to Moehau meant that rainfall was expected within 24 hours (Te Hiringānuku Ngāmane, personal communication, 2004).

Hauraki iwi were known as a tribe who travelled extensively by waka and therefore relied on their local knowledge of clouds to forecast the weather within the next 1-2 days in order to travel safely to their destination (H. Puke, personal communication). In Tēpu 7.6 further insight will be provided about the importance of clouds to Hauraki iwi.

TĒPU 7.6: NGĀ MOMO KAPUA – CLOUD TYPES

NGĀ MOMO KAPUA CLOUD CLASSIFICATION	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO TRIBE AREA SOURCE INFORMANT
AO Cloud	Generic name for cloud.	Iwi: Ngāti Pare-Ngāti Tamaterā. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Dicky Rakena.
AO-HAU Wind blown clouds	The shapes of clouds can show from what direction wind is expected. If the cloud was pointed wind would blow from that quarter.	Iwi: Ngāti Pare-Ngāti Tamaterā. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Dicky Rakena.
AOKAUTERE Swift, moving clouds	Visible sign of wind direction.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
IORANGI Cirrus clouds (Ci)	Known also as `Strips in the sky' or `Mares' tails', very high, wispy clouds. Changing weather pattern within 2-3 days, usually from fine weather to bad.	Iwi: Ngāti Tamaterā, Marutūāhu whānui. Rohe: Hauraki whānui. Kaikōrero: Taimoana Tūroa.

¹⁸⁶ Altocumulus lenticularis – a saucer like cloud that positions itself on top of mountain

¹⁸⁷ Coromandel Peninsula

KAPUA Cloud	Another generic name for cloud.	Iwi: Ngāti Kiriwera, Ngāti Taharua, Ngāti Taiuru-Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.
KAPUA-PANGO Cumulo-nimbus (Cb)	Dark, billowing storm clouds. Kapua-pango type clouds can produce torrential rain and can cause flash flooding, accompanied by destructive, damaging winds. Most kapua-pango storm clouds die away after about 20 minutes, due to the heavy rainfall.	Iwi: Ngāti Kiriwera, Ngāti Taharua, Ngāti Taiuru-Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.
KAPUA-TERE Scud	Fast-moving cloud	Iwi: Ngāti Kiriwera, Ngāti Taharua, Ngāti Taiuru-Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.
KOHU Fog	A lot thicker than mist. When tendrils of mist and fog descend from the mountain tops, kaumatua would say either Patupaiarehe had come to get you or our tupuna were amongst us.	Iwi: Ngāti Kiriwera, Ngāti Taharua, Ngāti Taiuru-Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.
POTAE Alto cumulus lenticularis (Ac L)	Saucer-like clouds positioned over mountains. Usually indicated that rain was expected. Mother would always look towards Te Aroha to check what the weather would be like for	Iwi: Ngāti Tamaterā. Takiwā: Ōhinemuri. Kaikōrero: Dicky Rakena.

	the day. If there was a 'potae' or a hat on Te Aroha she wouldn't put the washing out.	
TĀREHU Mist	Very light fog. 'Ngā puke ki Hauraki, ka tarehu', 'The hills of Hauraki are covered in mist'. Hauraki is well known for its mountain ranges being the haunt of tūrehu and patupaiarehe. They are nearly always covered in mist.	Iwi: Ngāti Kiriwera, Ngāti Taharua, Ngāti Taiuru-Ngāti Tamaterā. Takiwā: Hauraki. Kaikōrero: Tewi Nicholls.
TIPU-KEREKERE Cumulonimbus Incus (Cb I)	Thick, dark billowing clouds. These threatening dark clouds indicated that a violent storm was imminent. When Ngāti Pare saw this they went to high ground, moving away from any waterways due to possible flash flooding.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
TE KŪPENGĀ-O-TARAMAINUKU Alto-cumulus (Ac)	'The net of Taramainuku'. Low-lying overcast clouds that looked like the scales of a fish. Usually means it is either becoming overcast or the weather is clearing.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
TE MĀRA-KŪMARA-A-NGĀTORO-I-RANGI Cirrocumulus (Cc)	'The Kūmara gardens of Ngātoro-i-rangi'. Māori saw this type of cloud as resembling a raised bed of kūmara. High level clouds appearing as a group of small masses of white or pale blue,	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.

	fleecy clouds in a round, wavelike, rippled pattern, usually in regularly arranged groupings. Usually means that wet weather is on its way within 10 hours.	
TOTAL - 13		

5. Ngā Tohu Taiao - Weather, Climate and Seasonal Prediction

The iwi of Hauraki developed localised hunter gatherer skills, honed over many centuries. Knowledge that was introduced from eastern Polynesia such as lunar and seasonal calendars ensured that whenever they went out to fish they returned with a successful catch in excellent condition.

Environmental indicators of weather, climate and season appear to be simply defined by the term 'tohu' (Te Hiringānuku Ngāmane, personal communication, 23 Aug 2005). Four types of tohu were identified with Hauraki kaumātua and Hauraki practitioners. They are:

1. Tātai arorangi (celestial phenomena)
 - maramataka – the lunar cycle (see Whakaritenga me ngā Taputapu section)
 - seasonal position of the sun
 - ngā whetū marama – stars or star constellations
2. Huarere (weather)
3. Āhuarangi (climate)
4. Wāhanga-o-te-tau (seasonal changes)
 - life cycle of fauna and flora
 - Observed changes in fish behaviour or shellfish location

Ngā Tohu Huarere – Weather Indicators

Many Hauraki kaumātua talked about mountains such as Te Aroha or Moehau having a ‘potae’ or a hat on their heads, which meant rain was imminent. Unfortunately, none could say with much accuracy how long would it take to rain after the potae cloud¹⁸⁸ had formed.

Tomo Baggs (Ngāti Pāoa, Ngāti Tara Tokanui Tāwhaki, Ngāti Tamaterā, Ngāti Hako) explained that his mother Ngāraima would always keep a watchful eye on Te Aroha maunga from her kāinga at Mill Road. If it started forming a potae on its head, she would say to her whānau, *“Oh its going to rain tomorrow, waste of time putting the washing out”* (T.Baggs, personal communication, June 14, 2010).

I was very lucky to spend some time with Te Hiringānuku Ngāmane (Ngāti Pare-Ngāti Tamaterā, Ngāti Maru) travelling around the tip of the west coast of Te Tara-o-Te-Ika¹⁸⁹. He shared what he could remember from his father and how he had an uncanny ability to predict the weather.

The one clear memory Te Hiri had was a ‘tohu’ regarding the kākā. It was a powerful tohu that saved many Ngāti Pare lives¹⁹⁰. Another clear memory he had was how his father used to forecast weather conditions for the coming 2-4 days by observing the

¹⁸⁸ The closest description to a potae (hat) cloud is an altocumulus lenticularis cloud, also known as a cap cloud.

¹⁸⁹ Te Hiringānuku Ngāmane’s hapū, Ngāti Pare, is located from north of Papa-aroha to Muriwai at Port Jackson near the tip of Te Tara-o-Te-Ika.

¹⁹⁰ While siteseeing in Kyoto, Japan, I visited the Kiyomizu-dera temple. About 2 pm, above the ridge line of the mountains, I saw a flock of crows screeching and squawking; twisting and turning on the thermal air. I turned around and asked my Japanese host if that meant anything to him. He replied that it didn’t and then asked why. I explained that back in Aotearoa, if my mother’s people from Ngāti Pare see flocks of native parrots known as Kākā doing the same thing, it meant that a violent storm was about to explode on the Te Tara-o-te-Ika Peninsula in approximately 6-8 hours. That night about 9 pm, gale force winds struck our hotel in Nagoya. It was so strong that the building (I was on the 54th floor) started to sway, the windows seemed to expand and contract. It was very frightening. The next morning I found out that a typhoon had struck Kyushu approximately 600 kms due south of Nagoya, causing over 200,000 people to be evacuated and many people were thought to have died due to flooding and land slides. Daylight showed much damage in the streets below our hotel. When I met up with my Japanese host, he asked me how did I know that it was going to hit? I said I didn’t know that the typhoon was coming, only that the sign I saw yesterday with the crows acting up, looked just like what the kākā did before a powerful storm reaches our shores. He replied that this experience has made him want to conduct some research into traditional Japanese environmental knowledge of weather and climate.

shapes of the clouds sitting above the local mountain – Te Moenga-i-haua-e-Poutama¹⁹¹. In this way, everyone would know what to expect and therefore could make plans that would not be upset by the weather. Te Hiringānuku stated that the ‘maunga’ was their weather barometer.

I then asked Te Hiringānuku if he knew how to interpret the shapes of these clouds. He replied that following a long absence from Te Ūmangawhā during World War II, the opportunities to learn about this localised mātauranga were lost and thus unfortunately, he did not know. The following tables have been sourced from mainly one-on-one interviews and relevant literature:

TĒPU 7.7: NGĀ TOHU HUARERE – WEATHER INDICATORS

INGOA Name	TOHU Indicator	WHAKATAUNGA Expected Outcome	IWI TAKIWĀ AHUNGA KAIKŌRERO Tribe region source informant
HAU WAHO-O-TE-TONGA South-easterly wind	South-easterly starts blowing	Winds build in strength. Storm imminent.	Iwi: Ngāti Whanaunga. Takiwā: Manāia. Kaikōrero: Toko Renata.
KĀKĀ <i>Nestor meridionalis</i> - NZ Parrot	Kākā seen acting up squawking, twisting and turning above the ridge line or the canopy of the forest.	6-8 hours later violent storm strikes the northern tip of Te Tara-o-te-Ika. This storm will hang around for at least three days.	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Te Hiringānuku Ngāmane.
MAUNGAROA Located on the west side of Hapuakohe Ranges	Dark clouds gather upon the summit of Maungaroa	Rainfall imminent	Iwi: Ngāti Naho, Ngāti Hine, Ngāti Pāoa. Takiwā: Maramarua. Kaikōrero: Tohikurī. Ahunga: Cowan, 1987, pp. 226-228. Legends of the Māori, Vol 1.

¹⁹¹ Mt Moehau.

MOTUKOREHA¹⁹² Browns Island	'Island sinking out of sight'. In certain weather conditions Motukoreha seems to disappear or seem to be suspended above the moana when viewed from a distance.	Bad weather was expected from the east. These mirage-like conditions signalled to local Māori that wind was also expected.	Iwi: Marutūāhu whānui. Takiwā: Te Moana-tīkapakapa-o-Hauraki. Ahunga: Simmons, 1987, p. 73.
NGĀ KURĪ-A-WHĀREI Offshore reef near Bowentown	Compressed air created by heavy surf causes a moaning sound like a dog.	Bad storm approaching.	Iwi: Ngāti Pare-Ngāti Tamaterā. Takiwā: Te Puna, Katikati. Kaikōrero: Dicky Rakena.
OPAKETAI 'Place of driftwood'. Located at Birkdale Landing at the end of Beach Haven Road.	Driftwood seen along the beach at Opaketai	Predominantly strong westerly winds expected.	Iwi: Marutūāhu whānui. Takiwā: Waitematā. Ahunga: Simmons, 1987, p. 75.
RURU <i>Ninox novaeseelandiae</i> - Morepork	1. The changing cries of the 'ruru'. 2. The cries of two or more 'ruru' can be heard and typically their calls are shriller.	1. Warning of approaching rainfall. 2. Inclement weather	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Wati Ngāmane.
TE AROHA-A-UTA-TE AROHA-KI-TAI Mt Te Aroha	Potae (Lenticular cloud) over Te Aroha	Rainfall imminent approximately 24 hours	Iwi: Ngāti Tamaterā, Ngāti Hako. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Ngāraima Peeke, Matekino Royal.

¹⁹² Also known as Motukorea

TE MOENGA-I- HAUA-E-POUTAMA Mt Moehau	Potae (Lenticular cloud) over Moehau	Rainfall imminent approximately 24 hours	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika, Ōhinemuri. Kaikōrero: Te Hiringānuku Ngāmane.
TE RANGI-I- TOTONGIA-AI-TE- IHU-O-TAMA-TE- KAPUA Rangitoto Island	1. Mist on the peaks of Rangitoto. 2. Clear skies above Rangitoto	1. Rain expected 2. Fine weather expected.	Iwi: Marutūāhu whānui. Takiwā: Te Moana-o-Tīkapakapa-o-Hauraki. Ahunga: Tūroa, 2000, pp. 142-143; Simmons, 1987, p. 82
TOTAL - 10			

Ngā Tohu Āhuarangi – Climate Indicators

There were a number of migratory birds that were observed by Hauraki Māori as they returned from flying more than half way around the world to feast on the plentiful mātaimai at Pūkoro, Miranda or any other harbour or estuary found throughout Hauraki. Various sites throughout Hauraki, such as Ō-rongo near the west bank of the Waihou River, were used as observation posts to identify when these migratory birds, such as the kūaka (godwit) returned to snare them (Tūroa, 2000, p. 128). The arrival of the kūaka also signalled warmer spring weather, usually during the month of September. Hauraki kaumātua also mentioned that the migratory habits of the kūaka were seen to be mysterious as their nests were never to be found and they seemed to leave all at once to the north. The following whakataukī encapsulates the sentiment of these elders, *“Me he kāhui kūaka – Like a flock of godwits”* (Keane, 2017).

In Tēpu 7.8 a number of mainly birds and flora are identified along with a description of the tohu and the expected outcome. The majority of the sources were from Hauraki kaumātua.

TĒPU 7.8: NGĀ TOHU ĀHUARANGI – CLIMATE INDICATORS

INGOA Name	TOHU Indicator	WHAKATAUNGA Expected Outcome	IWI TAKIWĀ AHUNGA KAIKŌRERO Tribe region informant source
AUA <i>Aldrichetta forsteri</i> - Yellowed eyed mullet	Aua caught near the confluence of the Waihou and Ōhinemuri Rivers	Warmer spring and summer months are on the way.	Iwi: Ngāti Tamaterā. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Dicky Rakena.
KANAE <i>Mugil cephalus</i> – Grey mullet	Seen migrating downstream towards Tīkapa to breed.	The colder months of late autumn, early winter were upon them.	Iwi: Ngāti Tamaterā. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Dicky Rakena.
KOEKOEĀ <i>Endynamys taitensis</i> - Long-tailed Cuckoo	The cry of the koekoeā	Heralds the commencement of spring	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
KOWHAI <i>Sophora</i> spp	Flowers of the kōwhai start to fall to the ground	Kōwhai rains expected shortly during the month of September	Iwi: Ngāti Pāoa, Ngāti Whanaunga. Takiwā: Kerepēhi, Manāia. Kaikōrero: Haumarangai Conner.
KŪAKA <i>Limosa lapponica</i> - Bar tailed godwit	The cry of the kūaka	Heralds the commencement of spring	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Te Hiringānuku Ngāmane.
PĪPĪWHARAUROA <i>Chrysococcyx lucidas</i> - Shining Cuckoo	The cry of the pīpīwharauoa	Heralds the commencement of spring	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te Ika.

			Kaikōrero: Te Hiringānuku Ngāmane.
PŌHUTUKAWA <i>Metrosideros excelsa</i> – N.Z.Christmas Tree	<ol style="list-style-type: none"> 1. Early prolific flowering from the bottom upwards. 2. Early prolific flowering from the top downwards. 	<ol style="list-style-type: none"> 1. Dry summer, drought expected. 2. Wetter than normal summer expected. 	Iwi: Ngāti Tamaterā-Marutūāhu whānui. Takiwā: Te Tara-o-Te-Ika. Kaikōrero: Taimoana Tūroa.
PŪRIRI <i>Vitex lucens</i>	Early flowering	Long, dry summer	Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru. Takiwā: Te Tara-o-Te-Ika. Kaikōrero: Wāti Ngāmane.
OI <i>Pteradroma macroptera gouldi</i> - Grey Faced Petrels	Oi seen gathering at the Ruamāhua Islands off the east coast of Te Tara-o-Te-Ika	Warm, summer months are on the way.	Iwi: Ngāti Tamaterā, Ngāti Maru Takiwā: Whiritoa, Ruamāhua Islands. Ahunga: Te Hiringānuku Ngāmane.
TE PUNA-RERE-A-MARUTOHUHAU ‘The flowing spring of Maru’	<ol style="list-style-type: none"> 1. Puna flowed excessively during spring weather. 2. Puna flowered weakly during spring weather. 	<ol style="list-style-type: none"> 1. Fruitful, abundant season expected. 2. Bad season expected. 	Iwi: Marutūāhu whānui. Takiwā: Te Moana-tīkapakapa-o-Hauraki. Ahunga: Simmons, 1987, p. 81
TUNA PUHI <i>Anguilla dieffenbachii</i> - NZ Longfin Eel	Rivers are flooded, a lot of surface flooding. The head of the tuna becomes much more slender and tapered, almost	Tuna puhi seen migrating on the outgoing tide to spawn, signalling to locals the commencement	Iwi: Ngāti Pāoa, Ngāti Hako, Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki. Takiwā: Kerepēhi, Ōhinemuri.

	bullet-like and the eyes enlarge to up to twice their normal size.	of the late autumn/early winter months.	Kaikōrero: Tomo Baggs.
TOTAL - 10			

Ngā Wāhanga-o-te-tau – Seasonal Indicators

Hauraki tūpuna observed particular tohu to mark the different seasons of the year. The month of Hiringānuku, usually a wet month, also known as the time of the Kowhai rains, inanga return to spawn. Te Hiringānuku Ngāmane gave me a typed script of Ngāti Pare names of the months that were passed down from his father Ngākoma Ngāmane. The typed script actually started at Uhiuhiara¹⁹³, but I have started at Tahi-a-Pipiri, the first month of the Hauraki new year:

Tahi-a-Pipiri	June
Hongongoi	July
Hereturīkoka	August
Hiringānuku	September
Hiringārangi	October
Hakihea	November
Kaitātea	December
Uhiuhiara	January
Ruhīterangi	February
Poutūterangi	March
Paengāwhāwhā	April
Tahi-a-Haratua	May

¹⁹³ Star seen in January

These names represent particular stars that are seen during that time of the year. The seasonal migration of birds and fish species to the waters of Hauraki was cause for celebration. Hauraki tūpuna watched with anticipation the rising of certain stars as a guide to seasonal foods and fishing success.



Whakaahua 2: A.Skipper – Whāngai i te hautapu

Generally speaking, the rising of the Matariki constellation that was clear to the eyes meant that the following year would be a bountiful one. However, Ngāti Whanaunga kaumatua Toko Renata had a completely opposite meaning when Matariki was seen by his tūpuna:

We are told by the old people that there are many signs in the stars for the important task of collecting seafood. For example if Pleiades is shining brightly, we are told it is a bad time for flounder and eel fishing (Hauraki Māori Trust Board, 1999, p. 93).

Kōrero like this are important reasons why current generations need to groundtruth these observations that are inconsistent with other parts of Pare Hauraki. Perhaps it is an indicator that Hauraki tūpuna were starting to lose a lot of the depth of knowledge associated with Matariki? Hauraki practitioners are starting to revive the ‘whangāi i te hautapu’ or ‘feeding the gods’ during the celebrations of Matariki, which is the traditional practise of acknowledging ngā atua Māori for their guidance, protection and support.

Tuna and pātiki tend not to come out during fine weather as they become easy targets for predators. Tuna, especially, start migrating out to sea during stormy weather (Mita O’Brien, personal communication, 2002).

Many of the kaumātua talked about their grandparents’ generation and how they were the keepers of customary lore as understood by their tūpuna. We found that they could respond a lot more about seasonal indicators than about weather and climate tohu. They have fond memories of camping out with their koroua by the Waihou River to catch inanga in early September. Before setting up camp, their koroua would check the river

banks to see if the inanga run had started properly. According to Tomo Baggs, there are five tohu that his mother used to determine the inanga were running. Those tohu are included in the table below. Tomo's mother, Ngāraima, would not even bother to try her luck if the tohu were not seen. These were special times that kaumātua and mokopuna would spend asking questions and disseminating ancient customary lore. They would talk about the migration of key fish species such as pātiki, pioke, tamure and tuna within the shallow coastal waters of Tikapa Moana and what were the main tohu that signalled a particular migration¹⁹⁴. Traditionally throughout Hauraki, the extensive coastline and the numerous harbours supported a bountiful fishery, including kaimoana such as pipi, tuangi, kūtai, tūpā, tio, pūpū, pāua, papaka, and kina. Unfortunately due to the felling of the dominant kauri forests that used to grow on Te Tara-o-Te Ika, and the podocarp forests on the Hauraki Plains, unprecedented levels of sediment have inundated Hauraki's famous mātaimai, impacting negatively on this important natural resource forever. Another consequence of deforestation across the Hauraki Plains is that local Māori have had to rely on introduced trees like the willow, to signal the imminent arrival of an inanga run up the Waihou River, when the willow start to come into leaf during spring. Tēpu 7.9 identifies a mixture of flora, fauna and star constellations along with a description of the indicator, the expected outcome and Hauraki's seasonal tohu:

TĒPU 7.9: NGĀ WĀHANGA-O-TE-TAU – SEASONAL INDICATORS

INGOA Name	TOHU Indicator	WHAKATAUNGA Expected Outcome	IWI TAKIWĀ AHUNGA KAIKŌRERO Tribe region informant source
INANGA <i>Galaxias maculatus</i> - Whitebait	<ol style="list-style-type: none"> 1. Tree leaves on the banks of the river showing a flush of new growth. 2. Clouds of namunamu seen flying above the Waihou River. 3. A westerly breeze is blowing. 4. The main river current is hugging 	When all these five tohu are observed, inanga run is imminent. signalling the spring months.	Iwi: Ngāti Pāoa, Ngāti Hako, Ngāti Tamaterā, Ngāti Tara, Tokanui, Tāwhaki. Takiwā: Kerepēhi, Ōhinemuri. Kaikōrero: Tomo Baggs.

¹⁹⁴ Tomo Baggs personal communication 2010

	<p>the eastern bank on a tai pari (incoming tide).</p> <p>5. A Tai-nui (king tide). Going out whitebaiting, three days before and after a Tai-nui.</p>		
KŌWHAI Sophora spp	Flowers of the kōwhai blooming.	Kina (<i>Evechinus chloroticus</i> - sea urchin) and kūtai (<i>Mytilus edulis</i> - blue mussel) are fat and creamy, signalling the summer months.	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Te Tara-o-Te Ika.</p> <p>Kaikōrero: Wāti Ngāmane.</p>
KŪMARA <i>Ipomoea batatas</i> – NZ Sweet Potato	The first frosts occurred on the mainland	Kūmara crops are ready to be harvested on Ruamāhua Island.	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Waiaro.</p> <p>Kaikōrero: Wāti Ngāmane.</p>
MATARIKI Pleiades	<p>1. Stars within Matariki constellation are seen individually.</p> <p>2. Matariki constellation is vague to the eye.</p>	<p>1. Fruitful year ahead.</p> <p>2. Lean year (Tau Puhī) expected.</p>	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Waiaro.</p> <p>Kaikōrero: Wāti Ngāmane.</p>
MATARIKI Pleiades	Matariki shining brightly.	Bad time for floundering and eeling.	<p>Iwi: Ngāti Whanaunga.</p> <p>Takiwā: Manāia.</p> <p>Kaikōrero: Toko Renata.</p>
PŌHUTUKAWA <i>Metrosideros excelsa</i> – NZ Christmas Tree	Pōhutukawa in full bloom.	Kina (<i>Evechinus chloroticus</i> - sea urchin) and kūtai (<i>Mytilus edulis</i> - blue mussel) are fat and creamy, signalling the summer months.	<p>Iwi: Ngāti Pare-Ngāti Tamaterā, Ngāti Maru.</p> <p>Takiwā: Waiaro.</p> <p>Kaikōrero: Wāti Ngāmane.</p>
TE PUNA-RERE-A-MARUTOHUHAU	‘The flowing spring of Maru’. This puna seen	A fruitful year expected.	<p>Iwi: Marutūāhu whānui.</p> <p>Takiwā: Te Moana-o-Tīkapakapa-o-Hauraki.</p>

	flowing excessively during spring weather.		Ahunga: Simmons, 1987, p. 81.
TĪ WHANAKE <i>Cordyline australis</i> – Cabbage Tree	1. Profuse flowering with a strong, aromatic fragrance. 2. Lack of flowering.	1. Abundant season on the Waihou River. 2. Poor season.	Iwi: Ngāti Tamaterā. Takiwā: Te Tara-o-Te Ika. Kaikōrero: Dicky Rakena.
TOTAL - 8			

6. Tirohanga Whānui – Longitudinal Observation

Hauraki kaumātua had all noticed that climate in general had changed quite considerably during their lives. One of the key themes with all interviews was the decreased frequency of frosts experienced during participants' lifetime. Winters had become more mild, but increased rainfall caused a lot more land slips on the coast.

Ngāti Pare Kaumatua, Te Hiringānuku Ngāmane, is one of those elders who remember how cold the frosty mornings were in Te Ūmangawhā-o-ngā-waka (Colville). Ngāmane reflects:

During winter I remember it being really cold, not like today. I walked to school barefoot crossing paddocks to get there. I used to follow the cows stepping in the cow pats to keep my feet warm (T.H. Ngāmane, personal communication, 23 September 2004).

One individual noted that other than a lack of frosts, and mild winters, it was a lot harder to observe weather tohu such as kākā when they are no longer seen in great numbers in Hauraki. The lack of environmental indicators is a real problem. If Hauraki wants to revitalise this body of knowledge then these sorts of environmental indicators like kākā, and their natural habitat, need to be addressed.

7. Akoranga - Specialised Training

Whare Wānanga

When Marutūāhu first arrived at Hauraki, he erected a tūāhu on the flanks of Kohukohunui maunga, the first Hauraki-Tainui whare wānanga was erected between Hotunui and his son, Marutūāhu after the battle of Te Ika Pukapuka. This was done only once the area was deemed safe at the foothills of Mangatangi, a secluded area at the

rear of Tikiore Pā. Marutūāhu was a graduate of Ahurei, the Tainui whare wānanga at Kāwhia.

Marutūāhu's son, Tamaterā, as previously mentioned was a tohunga kōkōrangi. Not much is known about his expertise in this area, only that he frequented the known observation pā of Whakatau-toroa¹⁹⁵, Whare-kai-atua¹⁹⁶, Mātai whetū¹⁹⁷, Taumaharua¹⁹⁸ and Te Hō near Ngā Kurī-a-Whārei¹⁹⁹ (Takutai-moana Tūroa, personal communication, 1996)²⁰⁰.

Without the support of those who had undertaken formal and informal training to master the disciplines needed to understand and therefore predict the weather with reasonable accuracy, Tainui communities would have been left vulnerable and exposed to destructive storms. Specific whānau across Tainui rohe specialising in this body of knowledge had a great sense of responsibility, and were by nature protective of this mātauranga that had been passed down through the generations. Very rarely did they allow others outside of the whānau unit to acquire the deeper, spiritual knowledge. The following example demonstrates that Hauraki-Tainui had tohunga who had the mana and skills to influence the weather.

Wharewharengāterangi²⁰¹

Wharewharengāterangi was a renowned tohunga kokorangi from Ōhinemuri (Kāhui-ariki – Ngāti Hako, Tainui). He was a descendant from Hako-i-te-rangi daughter, Te Kukuti-o-te-rangi and Rakataura. The same Rakataura who was a tohunga kokorangi and tohunga tārai waka who built Tainui waka. Ngāti Hako are known as 'he iwi karakia'. The example refers to a time when Wharewharengāterangi's people refused for whatever reason to provide special foods and prepare the umu kohukohu to 'whāngai i ngā atua' or 'feed the gods'. This was a grave offence. Wharewharengāterangi immediately uttered

¹⁹⁵ Near Pūkorokoro - Miranda

¹⁹⁶ Located at the northern end of Port Jackson – Muriwai. Ōkaharoa is another site known where weather and seasonal observation took place on the headland to the north-east of Fletcher's Bay.

¹⁹⁷ At Kōpū located where the marae is situated on the hill that is orientated from east to west

¹⁹⁸ The summit above the Paeroa township

¹⁹⁹ Located on the highest point at Bowentown

²⁰⁰ See page 168

²⁰¹ See whakataukī section, they are a number of whakataukī that refers to Wharewharengāterangi

a karakia to the gods to punish them. He stood upon the summit of Taumaharua, as the skies darkened and a heavy downpour ensued flooding the village and the cultivations of his people on the river flats below. The people became fearful and pleaded for him to take pity and stop the flooding. He steadfastly refused, stating that once the plug of the waters of Keteriki, a small peak near Te Aroha, was opened up; the flow was impossible to stop until its waters had emptied its self. This caused widespread devastation to villages and crops below (Mead & Grove, 2001, pp. 31; 293; Riley, 2013, p. 71).

8. Whakaritenga me ngā Taputapu – Application and Tools

Karakia

At the beginning of the thesis is a copy of a karakia that was found in a manuscript by Hoani Nahe (Ngāti Maru). Horeta Te Taniwha, a senior Ngāti Whanaunga – Marutūāhu rangatira, tohunga kōkōrangi, was the source that Best (1976) used to quote a number of karakia. All these types of karakia demonstrate that Hauraki-Tainui tohunga had the ability to understand localised weather systems and therefore it is quite compelling that he knew how to effect the weather (pp.389-390).

He Karakia Tua-i-te-rangi²⁰²

- Rakuhia mai
Rakuhia mai te korokoro o Rangitoto
Kia rakuhia
Kia ao rawa ake te rā
He tio, he huka, he hauhunga

He Karakia Whakaara i te hau

Horeta explains that to raise the four winds, it has to be done in a particular sequence:

- **Hauraki**
Hau nui, hau roa, hau titipārerarera
Kotia mai (i) Hauturu kia kau i te wai

²⁰² Also known as pururangi

- **Hautonga**

Hau nui, hau roa, hau pūkerikeri

Kotia mai (i) Kohukohunui

Kotia mai kia kau i te wai

- **Haurāwhiti**

Haunui, hau roa, kotia mai (i) Taranga

Kia kau i te wai

Moi, moi, kia kau i te wai

- **Hauāuru**

Haunui, hau roa, hau pūkerikeri

Kotia mai i Rangitoto kia kau i te wai

Maramataka

Hauraki tūpuna needed to adapt to the environmental conditions where their kāinga are located. This was achieved by prominent tūpuna like Rakataura²⁰³, a tohunga kōkōrangi and a tohunga tārai waka, who characterised each lunar phase to better understand the effect the moon has on daily weather conditions, on the tides and currents of the estuaries and the moana. Each whānau and hapū living in a particular settlement needed to create their own maramataka to know best when to undertake certain activities. I managed to identify two maramataka from Hauraki. One is sourced from Te Hiringānuku Ngāmane father, Ngākoma Te Whaaki Ngāmane²⁰⁴ from Ngāti Pare-wahaika-Ngāti Tamaterā located at Te Ūmangawhā-o-ngā-waka²⁰⁵ and another is sourced from Hoani Nahe from Ngāti Maru located at Hoterene in Thames.

Tēpu 7.9 comprises of these two maramataka. Te Hiringānuku Ngāmane, fished in accordance with the teaching he had acquired from his father Ngākoma, one of the very few who recorded local customary knowledge. Ngāmane learnt the meaning and the significance of each lunar phase for line fishing near Te Ūmangawhā-o-ngā-waka. He

²⁰³ Rakataura married Te Kukuti-o-te-rangi, the daughter of Hako i te rangi from Ōhinemuri.

²⁰⁴ Sourced copy from Ngākoma's son Te Hiringānuku (Bo) Ngāmane

²⁰⁵ Colville

kept detailed diaries of his observations based on his knowledge of the maramataka. Fortunately, Ngāmane's maramataka provides a basic description regarding fishing only. Hoani Nahe's version does not provide any explanation for each lunar phase.

Further research is required to groundtruth the following information, to identify and unlock other customary activities as well. The different colours within the maramataka represent each lunar quarter.

TĒPU 7.10: NGĀ MARAMATAKA O HAURAKI – HAURAKI LUNAR CALENDAR

NAMA O NGĀ PŌ LUNAR PHASE	TE HIRINGĀNUKU NGĀMANE NGĀTI PARE - NGĀTI TAMATERĀ	MAHI HĪ IKA ĀHUA / TE WĀ SUCCESS / TIME	HOANI NAHE²⁰⁶ NGĀTI MARU – MARUTŪĀHU WHĀNUI
1.	Whiro	Kino / Te Rā Katoa	Whiro
2.	Tirea	Kino / Te Rā Katoa	Tirea
3.	Hohoata	Pai / Te Ata	Hohoata
4.	Ōūenuku	Pai / Te Ata	Ōūenuku
5.	Ōkoro	Pai / Te Pō	Ōkoro
6.	Tamatea-tū-tahi	Pai / Te Rā Katoa	Tamatea-kaiariki
7.	Tamatea-tū-rua	Pai / Te Rā Katoa	Tamatea-kani
8.	Tamatea-whakapau	Pai / Te Rā Katoa	Tamatea-ngana
9.	Huna	Kino / Te Rā Katoa	Tamatea-More
10.	Ariroa	Pai / Te Rā Katoa	Ari
11.	Māwharu	Pai / Te Pō	Huna
12.	Ōhua	Pai / Te Rā Katoa	Ōhua
13.	Maurea	Kino / Te Rā Katoa	Māwharu
14.	Hotu	Kino / Te Rā Katoa	Hohi
15.	Atua	Kino / Te Rā Katoa	Atua
16.	Turu	Pai / Te Ata	Maure
17.	Rākaunui	Pai / Te Pō	Turu
18.	Rākau-mā-tohi	Pai / Haurua rā	Rākaunui
19.	Takirau	Kino / Te Rā Katoa	Rākau-mā-tohi
20.	Ōike (Ōue)	Kino / Te Rā Katoa	Takirau

²⁰⁶ Nahe, 1893-1894

21.	Korekore-tū-tahi	Kino / Te Rā Katoa	Ongohi
22.	Korekore-tū-rua	Kino / Te Rā Katoa	Korekore-te-whiwhi
23.	Korekore-piri-ki-ngā-Tangaroa	Kino / Te Rā Katoa	Korekore-te-rawea
24.	Tangaroa-ā-mua	Pai / Te Rā Katoa	Korekore-piri-ki-ngā-Tangaroa
25.	Tangaroa-ā-roto	Pai / Te Rā Katoa	Tangaroa-ā-mua
26.	Ōkiokio	Pai / Te Rā Katoa	Tangaroa-ā-roto
27.	Ōtāne	Pai / Te Rā Katoa	Tangaroa-ā-kiokio
28.	Ōrongonui	Pai / Te Rā Katoa	Ōtāne
29.	Mauri	Kino / Te Rā Katoa	Ōrongonui
30.	Mutuwhenua	Pai / Te Rā Katoa	Mauri
31.			Ōmutu
32.			Mutuwhenua

The first five lunar phases in the above two Hauraki maramataka are the same; however the following first lot of **Tamatea** nights are different. Ngāmane only identifies three nights, whereas Nahe identifies four nights, and they are all different to Ngāmane. On the fifteenth night known as **Atua** both maramataka are the same. However after this night it changes again with Nahe adding an extra phase known as **Maure**. This puts out the maramataka by one night. Every night is the same except for **Ōike** and **Ongohi**, **Ōkiokio** and **Tamatea-kiokio**; and the inclusion of one other night known as **Ōmutu**. The second lot of **Tamatea** nights are essentially the same. Ngāmane names thirty lunar phases in total, as opposed to thirty two lunar phases with Nahe.

These examples of Hauraki maramataka are fundamentally a tool that provided the basis for Hauraki iwi to better understand the complex nature of local daily weather and climate. The challenge for Hauraki iwi is to unlock each of these maramataka to understand each lunar phase and what these meant to local whānau and hapū.

According to Professor Matamua, the rising of Matariki during a Tangaroa phase signals the beginning of the new year. Hauraki has commenced the ceremonial practice of ‘Whāngai i te hautapu’ or feeding the gods/stars during Matariki.

I was notified by a relative that a well-known maramataka tohunga from Ngāpuhi, Rereata Makiha²⁰⁷ had held maramataka wānanga on Waiheke Island in an attempt to recalibrate a Hauraki version to benefit the local community. With this in mind, there are a number of whanaunga from Hauraki that want to recalibrate Ngāmane and Nahe's maramataka with Makiha's assistance to gain insights and ancestral wisdom revitalising this cultural practice.

HE WHAKARĀPOPOTOTANGA - SUMMARY

The majority of Hauraki-Tainui kaumātua could speak Te Reo Māori, but only a third were known as native speakers²⁰⁸. Reading through the first case study it is easy to assume that Hauraki-Tainui has a rich, thriving localised knowledge regarding traditional weatherlore. But as Pou Temara has stated, "Mātauranga is not mātauranga if its not passed on". What does the data say about Hauraki-Tainui? Here are the results:

1. **Worldview:** A Tainui whakapapa was identified that commenced from Te Kore to Apanui, linking Te Ira Atua with Te Ira Tangata. A total of 103 generations (1) worldview
2. **Te Ao Wairua:** (6) tohu aituā, tohu mate identified
3. **Ngā Maumaharatanga:** (12) whakataukī; (28) wāhi ingoa; (1)²⁰⁹ waiata identified
4. **Ngā Whakarōpūtanga:** (6) momo ua; (28) momo hau; (12) momo kapua identified
5. **Ngā Tohu Taiao:** (10) tohu huarere , (10) tohu āhuarangi, and (7) tohu o te tau identified
6. **Tirohanga Whānui:** All participants recognised marked changes in the climate. (5) changes identified
7. **Akoranga:** Tamaterā, Wharewharengāterangi, Horeta Te Taniwha and Tīwai Paraone identified as tohunga kōkōrangi (4). Three whare wānanga, namely Whare-kai-atua, Mātai Whetū and Taumaharua identified²¹⁰.

²⁰⁷ Met Rereata Makiha at a Maramataka wānanga held at Waipuna Lodge in 4-7 June 2013. Rereata stated that he had met with success recalibrating the maramataka that he had been brought up with by his karani mā in Tāmaki makaurau.

²⁰⁸ Currently 10 of these participants have passed.

²⁰⁹ See Tēpu 7.3 under ua

²¹⁰ Well-known that there were other institutions of higher learning such as the one that Hotunui and Marutūāhu established at Tikiore and Whakatau-Toroa

8. **Ngā whakaritenga:** Identified karakia tua-i-te-rangi and whakaara i te hau (7)²¹¹; ngā wāhanga o te tau (1); and maramataka (2)

A total of **139** components have been presented here using this model for Hauraki-Tainui. It is not an exhaustive list of all the spiritual, weather, climate and seasonal phenomena within Hauraki-Tainui. Although Hauraki-Tainui has scored relatively high, kaumātua have stated that this ancient discipline is no longer actively practised. Due to the close proximity to Tāmaki makaurau²¹², the impacts of colonisation coupled with the detrimental effects of kauri logging, goldmining, land loss and draining the Hauraki Plains, tangata whenua were unable to observe with clarity the environmental indicators because they no longer existed in the numbers known before the advent of the Pākehā (Hauraki Māori Trust Board, 1999, pp. 6-10). Cultural practitioners of Hauraki-Tainui environmental knowledge of weather and climate cannot apply their skills of observation when the environmental indicators are non-existent.

The second case study involves my father's people, Te Whānau-a-Apanui from the Eastern Bay of Plenty.

²¹¹ Including the karakia at the beginning of this thesis, page I

²¹² Auckland

Ūpoko Tuawaru: Wāhi Rangahau Tuarua - Te Whānau-a-Apanui

Case Study Two: Te Ika-a-Māui - Te Whānau-a-Apanui

*Tahia te marae, ko Tū, ko Rongo koe. Te Kuti Te Wera, Te Rātā, Te Hauā e – E ko Apanui e!*²¹³



Mahere 2: Te Whānau-a-Apanui Rohe (Region)

This chapter is dedicated to senior Te Whānau-a-Apanui kaumātua, Wīremu Karuwhā Tāwhai (Te Whānau-a-Rūtaia, Te Whānau-a-Apanui, Ngāti Awa and Te Whakatōhea), also known affectionately as Uncle Bill. He was very passionate about Te Whānau-a-Apanui mātauranga and strongly believed that his tīpuna were Māori scientists of the highest order.

ROHE - REGION

*Mai i Taumata-o-Apanui ki Pōtaka
Ko Whanokao te maunga
Ko Mōtū te awa
Ko Te Moana-o-Toi-te-huatahi te moana
Ko Whakaari te Pūia
Ko Apanui te tangata
Ko Te Whānau-a-Apanui te iwi.*

*From Te Taumata-o-Apanui to Pōtaka
Whanokao is the mountain
Mōtū is the River
Toi-te-huatahi is the sea
Whakaari is the active volcano
Apanui is the ancestor
Te Whānau-a-Apanui is the nation*²¹⁴.

Te Whānau-a-Apanui rohe is dominated by Te Moana-o-Toi to the north, and except for a narrow coastal strip of land, it consists mostly of mountain ranges all the way down to the coast. The rohe commences at Te Taumata-o-Apanui, located off the western shoreline of Hāwai and stretches all the way along the sweeping curve of the coastline to slightly past Tihirau at Te Pōtaka near the East Cape. It then extends inland along the Raukūmara Ranges heading in a souwesterly direction past Whanokao maunga and heads in a westerly direction back to its commencement point at Taumata-o-Apanui.

²¹³ Mita O'Brien personal communication

²¹⁴ Te Whānau-a-Apanui do not view themselves as a tribe due to the colonial connotations associated with it. Pākehā used the term tribe in a derogatory way in an effort to dehumanise them (Maniapoto).

TE HUARERE ME TE ĀHUARANGI – LOCAL WEATHER AND CLIMATE

The Te Whānau-a-Apanui rohe experiences one of the mildest climates in Aotearoa, and other than Whakatū–Nelson, some of the highest sunshine hours too. This eastern area of the North Island is sensitive to changes in weather and climate, impacted from time to time by severe drought, intermittent subtropical storms and associated extreme rainfall events, and rapid flooding causing heavy silting of low lying coastal areas. Due to the sheltering of the high country to the west, south and east, day-to-day variations in weather are largely determined by the direction of the wind (Quayle, 1984; Chappell, 2014). The term “microclimate” has been applied to this rohe because the north sloping mountain ranges trap and hold more sunlight and therefore the rohe experiences significantly warmer temperatures for a lot longer than neighbouring areas. The rich, volcanic, loamy, free draining soils, coupled with the excellent climatic conditions, are quite conducive to growing difficult crops such as kūmara. There are a number of significant, dormant volcanic cones located within this rohe. Local whānau and hapū could distinguish what type of weather conditions they can expect by observing these mountains in the early morning before sunrise and the late afternoon before sunset on a daily basis. Te Whānau-a-Apanui tīpuna knew that particular cloud shapes and colours could mean inclement weather to be expected. Other than the geographical area explained above, this area is dominated by a north-facing Te Moana-a-Toi Pacific Ocean, consisting of one island of note, namely Whakaari 321m (White Island). It is an active volcano, located approximately 42km northwest of Otūwhare, Omaio.

PŪRĀKAU-Ā-IWI – TRIBAL HISTORY

Te Whānau-a-Apanui iwi are descendants of more than one ancestral waka. They are Mātaatua, Te Arawa, Takitimu, Nukutere, Tainui, Horouta and Taurima-tawhiti. After the successive arrivals of these ancestral waka to Aotearoa, this part of the Eastern Bay of Plenty was settled by Porourangi and his people. Apanui Ringamutu and his descendants wrested this area from the tangata whenua and began the establishment of Te Whānau-ā-Apanui iwi. The iwi was named after Apanui Ringamutu because of his ancestry and prestige. His father was Tūrī-rangi, a direct descendant of the senior lines of Tamatekapua of Te Arawa and the Ngāriki people of the Taurima-tawhiti waka. Rongomaihuatahi, Apanui’s mother, was a direct descendant of Porourangi, of Ngāti

MĀUI-TIKITIKI-A-TARANGA

Ruatonganuku

Ruatongarangi

Tahu

Rongotope

Marunui-a-Whatu

Toi-kai-rākau

Raurunui-a-Toi

Ngā Puna-ariki-a-Whatonga

Poutūpari

Pouturiao

Manutohikura

Tāneuarangi

Paikea

Pouheni

Tarawhakatū

Nanaia

Porourangi

Hau

Rākaipō

Manutangirua

Hingangaroa

Tauārai

Apanui Waipapa

Rongomaihuatahi

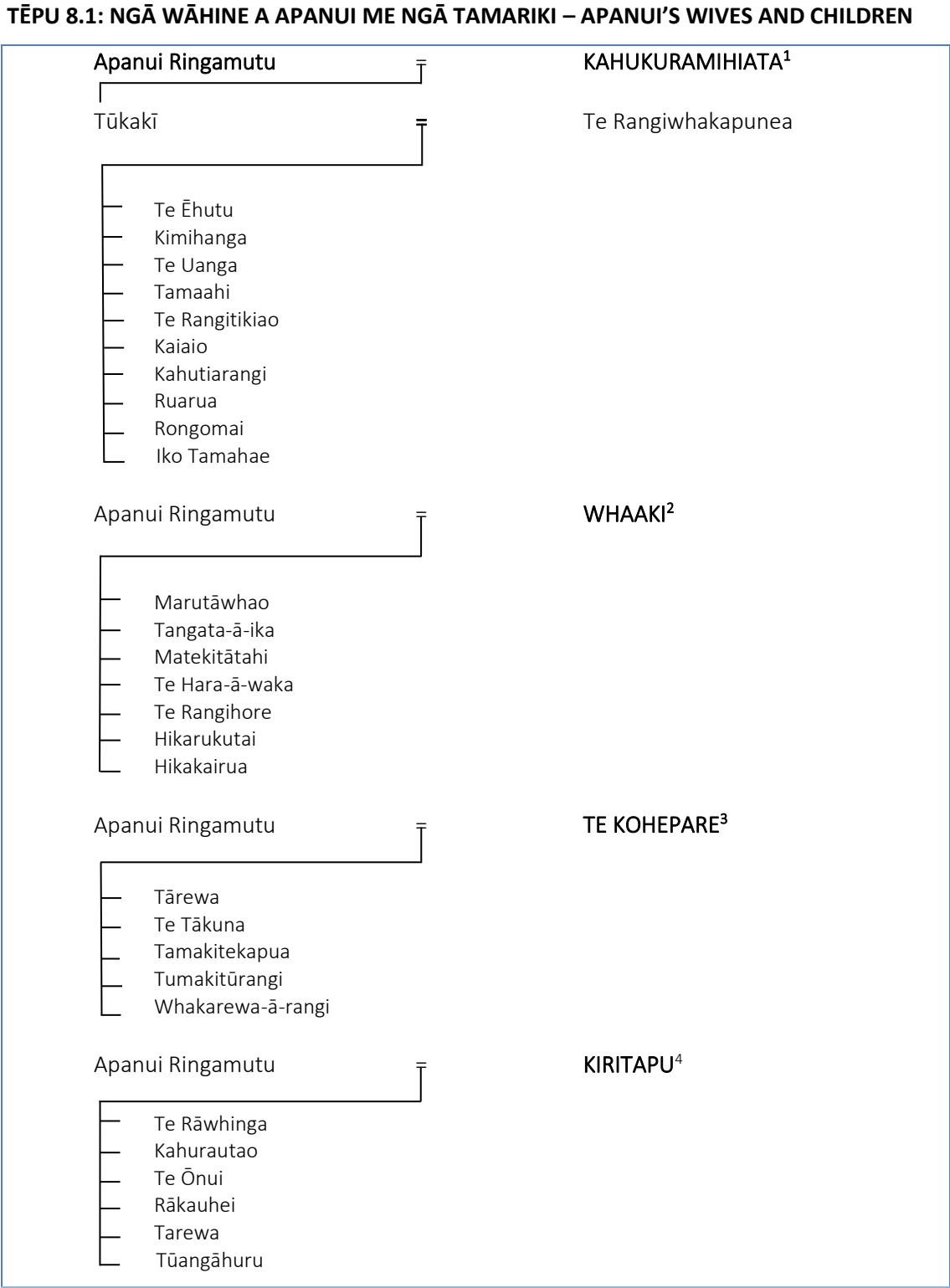
APANUI RINGAMUTU

Porou. She descends from the senior lines of Paikea, Nukutere, Horouta, Takitimu and Mātaatua waka. As a child Apanui acquired land from both the Ngāti Porou and Ngāriki people. When Apanui was a young boy, Rongomaihuatahi's brother, Te Ao-Takaia and other Ngāti Porou whanaunga landed at the beach at Omaio. She and her child hid in bushes below the pā. She instructed her son to wander down to the beach where his uncle stood and if he asked who he was, he was to say, "Ko Apanui ahau, he tama nā Rongomaihuatahi". This he did and when Te Ao-Takaia found out who he was, he picked him up in joy. Thus his mana was enhanced when his uncle Te Ao-Takaia bequeathed to him all the lands from Potikirua to Puketapu (Paora, personal communication, 25 May 2005).

Not wanted to be outdone, his matua Tūrī-rangi ceded to his son all the land from Te Taumata-a-Apanui to the Motu River, bypassing his own four children by his first wife Hine-tama. Later, when Apanui came of age, he acquired the land between the Mōtū River and Puketapu by conquest. Much prestige and honour fell upon Apanui and his people. Apanui Ringamutu had four wives and many children. His senior wife was Kahukuramihia, the mother of his eldest son Tūkākī. His second wife was Whaaki of Ngāi Tai, who was the mother of seven of his children. Whaaki's sister, Te Kohepare, was Apanui's third wife, and she bore him five children. Kiritapu, his fourth wife, also had five children.

It was a time of simply fighting to survive and many of this combative class make up the history of this fledgling nation. Notable among them was Apanui's mokopuna, Iko Tamahae, the renowned ambidextrous weapons master, who led and organised the uri of Apanui Ringamutu into a mobile and

devastating fighting force. Warfare raged for many years from Hāwai in the west to Ngāti Porou in the east and over the Raukūmara ranges to the south. The following whakapapa shows Apanui Ringamutu, his four wives and their tamariki (Paora, 2006. pp. 238-241):



Today the iwi consists of 13 hapū; each hapū or whānau occupying established kāinga in the fertile coastal pockets found within this rohe. Hapū boundaries were clearly defined by ridge lines, hills, rivers and coastal headlands.

TĒPU 8.2: NGĀ HAPŪ O TE WHĀNAU-A-APANUI – THE SUBTRIBES OF TE WHĀNAU-A-APANUI

HAPŪ	MAUNGA	AWA	MARAE
1. Te Whānau-a-Harāwaka	Ranginui	Hawai	WN ²¹⁵ : Te Harāwaka
2. Te Whānau-a-Hikarukutai, Ngāti Horomoana	Otūkani	Mōtū	WN: Iwarau WK: Tūmataunga
3. Te Whānau-a-Tūwahiawa, Ngāti Paeakau	Oariki	Waipapa	WN: Tūtawake WK: Te Rangitaetaea
4. Te Whānau-a-Nuku, Ngāti Horowai	Rangipoua	Waioira	WN: Rongomaihuatahi WK: Te Rau Aroha
5. Te Whānau-a-Rūtaia	Rangipoua	Hāparapara	WN: Te Poho-o-Rūtaia WK: Tā Apirana
6. Te Whānau-a-Hine-te-kahu, Te Whānau-a-Toihau	Moaha	Waiorore	WN: Toihau WK: Hinehaurangi
7. Te Whānau-a-Te Ēhutu	Kakanui	Kereu	WN: Tūkākī WK: Te Rangiwhakapunea
8. Te Whānau-a-Kaiaio	Maungaroa	Kereu	WN: Kaiaio WK: Te Ikiwa-o-Rehua
9. Te Whānau-a-Kahu	Mihimarino	Waipapa	WN: Kahurautao WK: Kiritapu
10. Te Whānau-a-Maru	Kirieke	Wairūrū	WN: Hinemahuru WK: Maruhaeremuri
11. Te Whānau-a-Pararaki	Tawhitinui	Tauranga	WN: Pararaki WK: Hineretā
12. Te Whānau-a-Kauaetangohia	Tihirau	Whangaparāoa	WN: Kauaetangohia WK: Te Whatianga
13. Te Whānau-a-Tapaeururangi	Maungahiha	Oweka	WN: Te Ēhutu WK: Te Ruatarehu

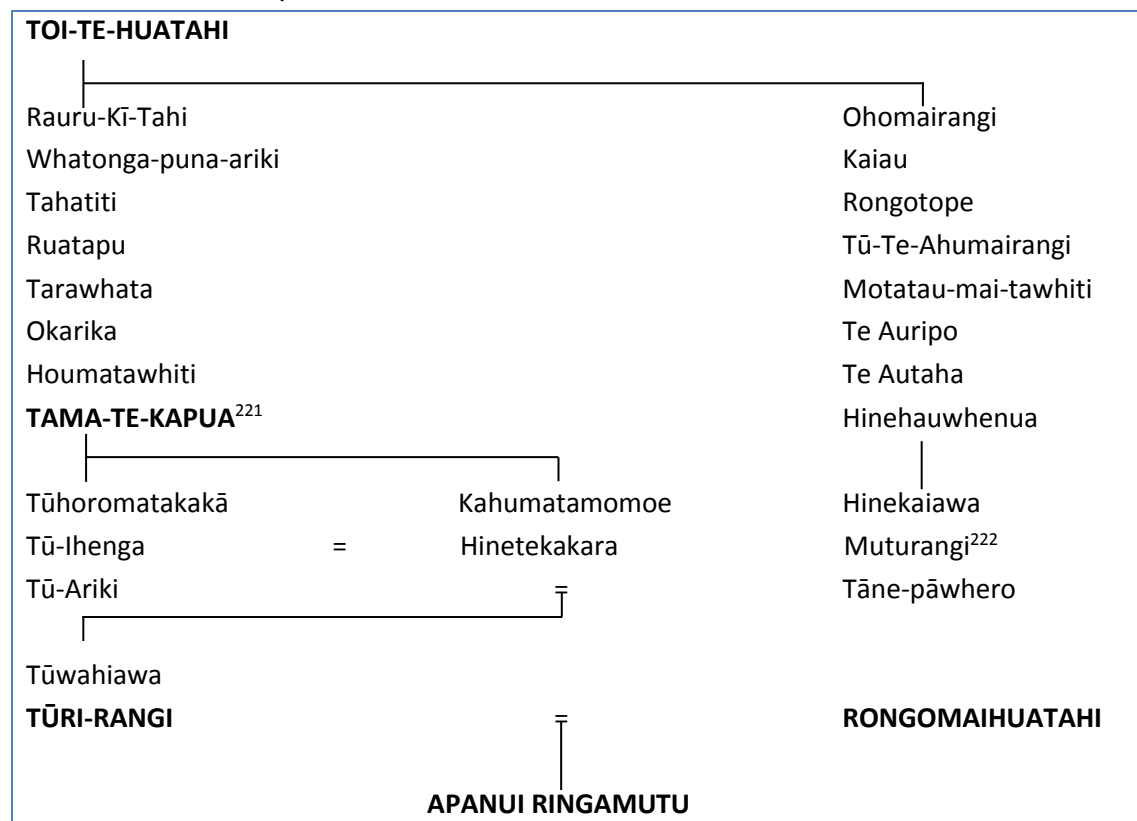
The following whakapapa shows Te Whānau-a-Apanui connection to Te Arawa waka through Tūrī-rangi. These people were then known as Ngāriki, who had settled at Tunapahore. Tūrī-rangi is a descendant of Tūhoromatakākā, the eldest son of Tama-te-kapua. After suffering continued humiliation at the hands of his tuākana, Taua²¹⁶, and Māhaki-ewe-karoro, the youngest brother, Hauiti, retaliated, driving Taua, Mahaki and their whānau out of Te Ūawa. This family feud escalated into a full-scale civil war. Hauiti got the best of his tuākana. A small remnant of Taua's whānau managed to escape, fleeing to what is now known as Maraenui where the Te Arawa high chief Tūrī-rangi

²¹⁵ WN – Wharenuī; WK - Wharekai

²¹⁶ Apanui Waipapa's father. Also known as Tauārai, Taua-Ariki and Taua-i-te-rangi

lived. Even though Tūrī-rangi already had a wife, Hinetama, Te Ao-Takaia²¹⁷ persuaded him to protect his people and if he was successful in doing so he would offer their celebrated puhī, their sister Rongomaihuatahi as another wife for him. When Hauti's ope tauā eventually arrived to kill Rongomaihuatahi and her people, Tūrī-rangi's people were ready. A fight ensued on the waka tauā at night, ending in the complete rout of Hauti's forces. From this defining moment, Tūrī-rangi not only succeeded in driving off the incursion, but also gained an invaluable ally to repulse an expected revenge attack from Hauti and his people. When a kaupapa²¹⁸ of waka tauā led by Kahukuranui²¹⁹, was heard making landfall on the beach below, Tūrī-rangi and his forces dropped down from their pā to engage them. Tūrī-rangi killed Kahukuranui²²⁰ in close combat, and was also successful in defeating his war party (Erueti Korewha, personal communication, 2006).

TĒPU 8.3: HE WHAKAPAPA MAI I A TOI KI A APANUI, TE ARAWA WAKA – GENEALOGY FROM TOI TO APANUI, TE ARAWA CANOE



²¹⁷ Son of Apanui Waipapa

²¹⁸ Flotilla

²¹⁹ Hauti's eldest son

²²⁰ Kahukuranui was Kahungunu's nephew. He was responsible for the murder of Apanui Waipapa

²²¹ Kaihautū of Te Arawa waka was buried on Moehau, as was his eldest Tūhoromatakakā

²²² Leading Chieftain of Ngāriki from Tunapahore. His daughters married into Te Arawa/Ngāoho lineage

The eponymous ancestor of Te Whānau-a-Apanui, Apanui Ringamutu, was known to have been a former student of his tīpuna, Hingangaroa, the celebrated high priest, of the whare wānanga known as Te Rāwheoro²²³. When asked how committed he was to higher esoteric learning, Apanui responded by cutting one of his fingers off. He also gave his long-lived tīpuna a famous taonga tuku iho, an heirloom known as Ngaio-tū-ki-Rarotonga. After completing his rigorous studies at Te Rāwheoro, he not only obtained the most current, innovative carving skills of the day, but also the deep philosophical teachings of his ancestor. Walker provides further context about Te Rāwheoro:

This was the most prestigious school of learning at the northern end of the East Coast, and, if you consider the accounts of the experts from the Wairarapa, they being scribed by Te Whatahoro, this was in fact the most prestigious school on the entire eastern seaboard'. The curriculum of the school was centred on whakapapa, tribal lore and the development and promotion of the arts. The genesis and cosmology of tribal origin was a core subject and significant Maori ancestors such as Tangaroa, Tane, Ruaumoko and others were an integral part of the learning (2012, p. 109).

Three particular carving patterns of note called Manāia, Taratara-ā-Kae and Taowaru are examples of what Apanui acquired. This style of carving was embraced by Te Whānau-a-Apanui iwi. Many of the Te Whānau-a-Apanui marae depict this style²²⁴ of carving. The following mōteatea was composed by Rangiūia, the last tohunga of Te Rāwheoro:

*Tō tōki, e hika, ko Hui-te-rangiora,
Tō tōki, e hika, ko Atua-haemata,
Tō tōki, e hika, ko te Rakuraku-ā-Tāwhaki!
Tēnei hoki te Manawa-ka-ue,
Tēnei hoki te Manawa-ka-pore,
Ko taku manawa rā ka hoake mōhou,
Te Manawanui-o-rangi,
Ko Hou-tina, ko Hou-maota,
Ko te Ahutu koe, ko Horo-te-pō e,
Ko Marua-nuku, ko Marua-rangi,
Ko Hau-whakatūria, ko Whakahotu-nuku,
Ko Whakahotu-rangi, ko Tū anō rā,
Ko Te Ao-mārama, aue!
Ko Tātai-arorangi, ko Te Huapae rā,
Ko te Rangi-hopukia, ko Hinehuhuritai,
Me ko Manutangirua, ko Hingangaroa.
Ka tū tōna whare Te Rā-wheoro e,*

²²³ There is another version that his son Tūkākī and not Apanui entered Te Rāwheoro (Erueti Korewha, personal communication, 1989).

²²⁴ Parts of Te Pōtaka, a Te Whānau-a-Apanui pātaka is a perfect example of Apanui style of carving. It is exhibited in Tāmaki Paenga Hira Museum.

*Ka tipu te whaihanga, e hika, ki Ūawa.
Ka riro te whakautu, te Ngaio-tū-ki-Rarotonga,
Ka riro te manaia, ka riro te taowaru,
Ka taka i raro na, i a Apanui e,
Ka puta ki Tūranga, ka hāngai atu koe,
Ki te ao o te tonga, i patua ai koe,
Kia whakarongo mai e tō tīpuna pāpā,
E Te Mātorohanga, nā i! (Durie & Black, 2013, p. 9)*

The mōteatea states that it was Apanui who obtained the tribal carving patterns, manāia and the taowaru. The art of carving evolved and advanced in Te Tairāwhiti during those volatile times, reaching the height of artistic excellence. Just as important was the development of the tohunga to have an acute, intimate knowledge of his local environment. He needed to know when the time was right to commence certain activities based on a particular phase of the maramataka and during the right season of the year. These renowned practitioners like Hingangaroa, Apanui, and his whanaunga Iwi-rākau²²⁵, understood that in order to carve exquisite examples of whakairo, you needed to know the right season, and the ideal weather conditions to safely fell the giant tōtara, the ideal tree for carving.

A network of kaumātua across Te Whānau-a-Apanui were responsible for keeping the sacred knowledge and practice of traditional weather and climate forecasting alive (W. Tāwhai, personal communication, 11 November 2004). Although all tribal members were brought up knowing a certain amount of localised knowledge pertaining to the weather, only particular individuals were chosen to learn the deeper understandings and teachings that had been passed down from the time the first tīpuna settled at Whangaparāoa. These individuals would have been identified at an early age to be assigned to close relatives who showed an acute, perceptive mind, a mind like Uncle Bill's.

When I asked Uncle Bill in 2009 if he would be my mentor aside from my supervisors' panel, he gladly accepted. We discussed what we all²²⁶ had achieved with the initial research project, and what needed to be done to address areas requiring further

²²⁵ Iwi-rākau and Apanui were both accepted at the same time to enter Te Rāwheoro.

²²⁶ Darren, Bill and I

research. Uncle Bill had an extensive network of cultural practitioners in mind to interview, who he thought would add to this body of traditional weatherlore. The plan we pulled together got him really excited. Unfortunately, on the 2nd December 2010, Uncle Bill passed away. I must be honest that there were many times I wanted to give up the PhD as I did not think I could complete this thesis without Uncle Bill's guidance. After a number of years had passed I tried one last time to locate the video tapes that Uncle Bill took of our interviews with Te Whānau-a-Apanui kaumātua, held at Te Wānanga o Awanuiārangi on 25 May 2005. If I failed, then I believe it was never meant to be. As 'luck' would have it, Liliana Clarke²²⁷ located them for me, sending me copies of the video recordings. I transcribed all the tapes, a 30,000 word taonga²²⁸ to base my second case study²²⁹. A number of secondary sources and manuscripts too were identified too assist with filling gaps in the interview transcripts.

I sincerely felt that this was Uncle's way of ensuring that I complete the PhD journey and including Te Whānau-a-Apanui as one of the case studies. I will now explain the 'Ngā Whenu Tapu e Waru' that make up Te Whānau-a-Apanui environmental knowledge of weather and climate based on the transcriptions, including interviews conducted with kaumātua. They are as follows:

1. Te Aronga-ā-Te Whānau-a-Apanui - Te Whānau-a-Apanui Worldview



Whakaahua 3: Kaiwhakaahua: A.Skipper – Tauira-mai-tawhiti waka - Kauaetangohia Marae

The single most fundamental kaupapa that encapsulates a Te Whānau-a-Apanui worldview is the Moki and the Kahawai pūrākau account. The central character of this narrative involves Poumātangatanga. The fishing traditions of the iwi and the intrinsic

²²⁷ One of the Te Wānanga-o-Awanuiārangi staff and PhD candidate

²²⁸ I never got to see these recordings, both Darren and I only took hand written notes during that initial research.

²²⁹ Danie Poihipi was also interviewed in 2010.

relationship with the moki and the kahawai is an integral part of the Te Whānau-a-Apanui psyche. The following is an historical account by Moana Waititi (1960, pp. 42-43); including other Te Whānau-a-Apanui kaumātua, who provided further comment to the moki pūrākau. The Te Whānau-a-Apanui creation narrative is not too dissimilar to other iwi creation traditions. It starts off with Rangi and Papa giving birth to numerous children in darkness. Six of these children played an important part in the lives of mankind. They were Rongomātane, Haumiatiketike, Tangaroa, Tānemahuta, Tūmataurangi and Tāwhiri-mātea. Mankind is said to have descended from Tūmataurangi, down to the tīpuna who sailed across Te Moana-nui-a-Kiwa from Hawaiki to Aotearoa. These tīpuna were the leading commanders of each waka. They were Motataumaitawhiti (Taurima-maitawhiti), Hoturoa (Tainui), Tamatekapua (Te Arawa), Tamatea-ariki-nui (Takitimu), Pawa (Horouta), Toroa (Mātaatua), Te Whironui (Nukutere) and many more (Waititi, 1960). According to Te Whānau-a-Apanui elder, Moana Waititi (1960), the moki narrative starts ironically after the Tainui waka made landfall at Te Taunga-waka (Jones & Biggs, 1995, pp. 36-38; Kelly, 1949), a bay located below the summit on the north-eastern side of Tihirau maunga. Hoturoa and his people then came around to the beach at Whangaparāoa-maitawhiti, named after the homeland they had left in Hawaiki. They anchored their waka by tying it to a large rock, known then as 'Te Riu-o-Tainui', but today it is known as 'Te Haika-o-Tainui'. Hoturoa decided to take some time to recuperate, refurbish their waka and also replenish the food and fresh water stocks. Unfortunately, an altercation that started initially between their tamariki as they trained for combat, quickly escalated when the adults became involved, which led to the serious wounding of Hotupae by Kokatangikiraukawa²³⁰. Hotupae was taken to the tūāhu where karakia was conducted, asking the atua Kahukura and Tūnui-o-te-ika to strengthen his will to live and to heal his body. As a result of this incident, a split occurred between Hoturoa people. Before it got worse, Hoturoa made the decision to leave behind the dissidents and search for another place to settle. In his rush to depart Whangaparāoa, he left behind the anchor, 'Te Punga-o-Tainui'²³¹. The relatives he left behind were Ruamoengārara, Kokatangikiraukawa, Mahia, Taikehu and their tamariki, Hīoreore, Hīwakawaka and Tataaueanoa. Ruamoengārara knew that

²³⁰ Another version by Don Edmonds states that Kokatangikiraukawa was killed

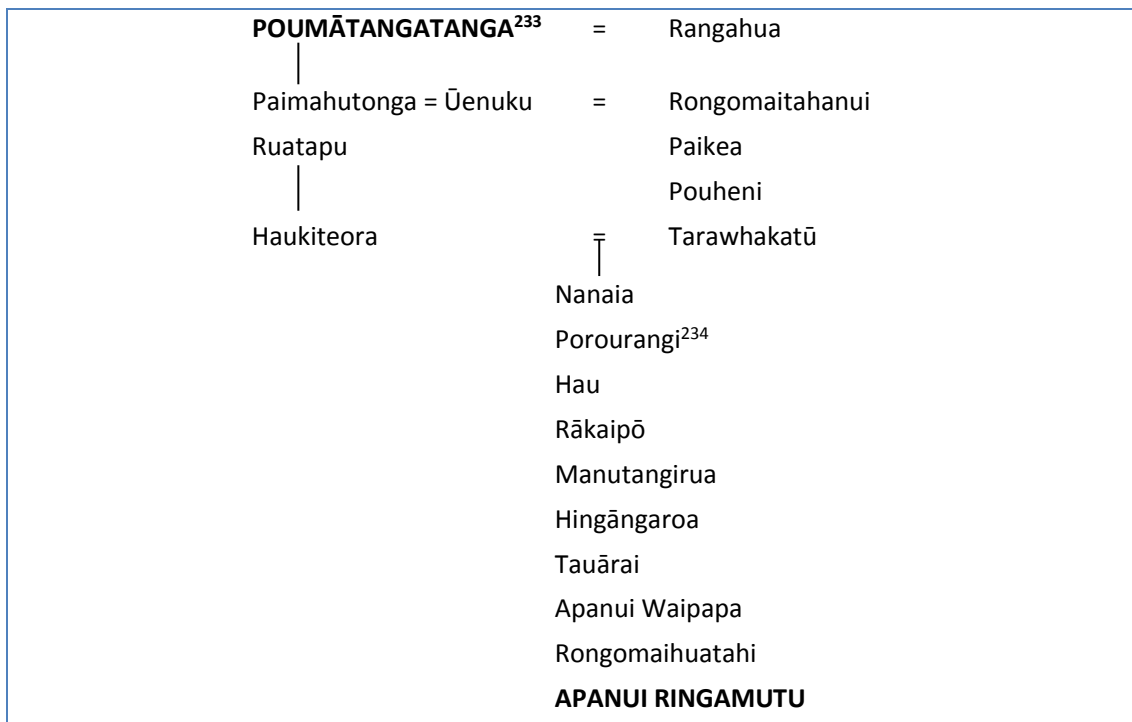
²³¹ 'The anchor of Tainui'

without Hoturoa and the rest of his skilled relatives who left with him, their chances of survival were slim. Therefore, he proclaimed to his relatives that he was travelling back to Hawaiki to convince their tuākana, Poumātangatanga, and father of Paimahutonga, to return with him to Aotearoa. Poumātangatanga was a high chief and tohunga from Rai'ātea. Before Rua left, he instructed Mahia to go to the east of Tihirau and study the stars, the sun and the moon²³². The children were instructed to climb up to the peak of Tihirau to study the tides, the calm and the rough seas and report back to Mahia. Taikehu was instructed to go inland and study the ngahere; what fruits were edible and what type of birds and animals were found there. After conducting appropriate karakia upon Puketapu, a sacred rock, Rua was swept away by a pod of taniwha called Tūtehihi, Tūtewawa and Tūtakawerangi and taken across the ocean, back to their homeland. There he spied Poumātangatanga. After greeting each other, Poumātangatanga asked Ruamoengārara why he had returned.

TĒPU 8.4: HE WHAKAPAPA MAI I NGĀ ATUA KI A POU RĀUA KO APANUI – GENEALOGY FROM THE GODS TO POU AND APANUI

RANGINUI-A-TAMAKU	=	PAPATŪĀNUKU
Tānenuiārangi		
Te Tāwai		
Tau-nui		
Tau-roa		
Tau-ringia		
Tau-horahia		
Matatūkiterangi		
Materoiho		
Mataroake		
Turī		
Pehu		
Tamatea		
Kahutia		
Te Anaunau	=	Te Aotū
Te Aohore		
Hinetuahoanga	=	Wahieroa
Rātā	=	Kaniowai

²³² Ruamoengārara knew that Mahia would gain an unobstructed view of the rising stars, sun and moon by travelling further east until the coastline turned due south



Ruamoengārara replied that he had returned to bring him back to Whangaparāoa. “Is it a beautiful place?” asked Pou. Rua said, “It is just like Whangaparāoa lying here”. Then Pou inquired after the whereabouts of the tamariki. Rua said, “They are on the hundred summits of Tihirau-otama, on Pūwharariki and on Te Ranga-a-Te-Anewa”. Pou then consented to return. But before they departed Pou sent his wairua to Hui-te-rangiora to visit Rehua by the pathway known as Te Aratiatia-a-Pawa, to ask him for one of his children. Rehua consented to giving Pou the moki, a sacred fish that had pouting lips. He said to Pou that the moki would make its own way back to Aotearoa, and that a sign will be given to let Pou know that the moki was about to arrive. He also gave him a set of lore that man had to abide by. If they broke this lore, or ill-treated the moki, his child would never return. Rehua also gave him a stick called Matuahautea, to catch the crabs that infest the coastline reefs. Crabs are the main source of food for moki.

Rua and Pou then went to Ruakapanga to ask for feathers from this bird. Some feathers were taken from underneath the right (Tauninihi) and left wing (Mokonuiārangi) to take

²³³ There is another version that Poumātangatanga was the father of Ūenuku and not Paimahutonga. Also known in other whakapapa versions as Po-matangatanga and Pai-matangatanga. Mohi Ruatapu (1875) has a similar whakapapa to the above.

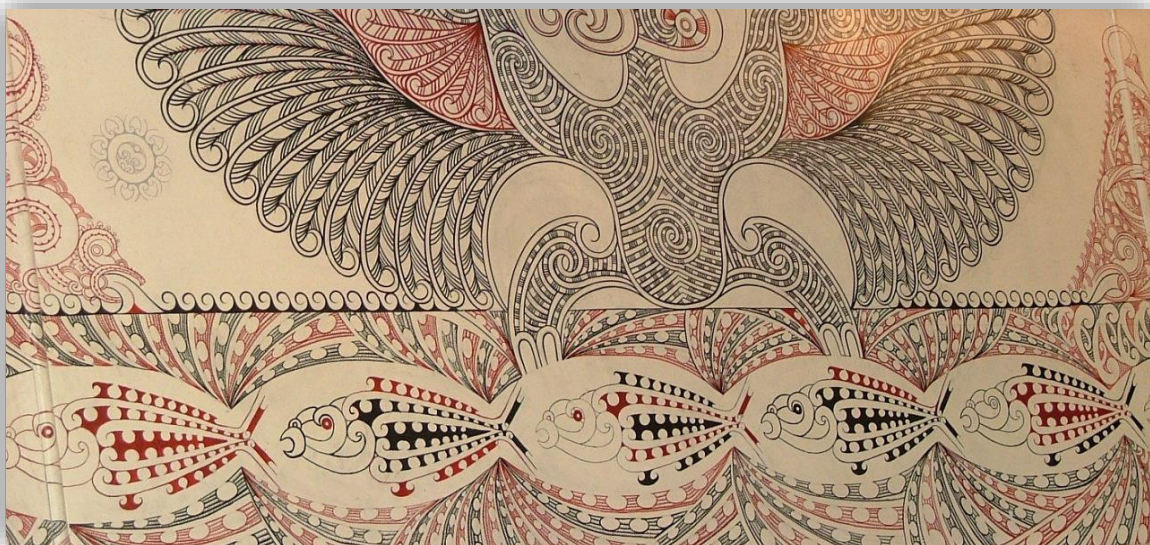
back in a hue called Tutumanawa to Aotearoa. Pou's waka, Tauira-mai-tawhiti, was then prepared to return to Whangaparāoa. They were accompanied with other relatives who brought gifts and precious cargo. Before they departed, Pou asked a tohunga named Ruatatanoa to conduct the karakia to ensure a safe passage for their waka.

Before departing, Ruatatanoa erred while uttering his karakia. He begged Pou for them not to go, that if they left some misfortune will befall the crew. Pou refused to listen to his advice. The return trip was uneventful until they had nearly reached the coastline. They heard the sound of the surf striking a known, hazardous rock. They steered the waka away from this rock only to strike another causing the waka to capsize. Fortunately everyone and their precious belongings made it safely ashore.

One of the men left behind by Ruamoengārara was Te Mahia. Te Mahia found the plants and the red feathers of Ruakapanga washed up on the beach, he then knew that Rua had returned. Near Te Taunga-waka, all of the rocks are black except for one, which happens to be red. It is believed that this is the rock on which Te Mahia had laid out the feathers of Ruakapanga to dry. When Pou saw the feathers of Ruakapanga woven into a headress on Te Mahia's head he demanded them back, but Te Mahia refused. Unfortunately, this was not the only slight to Pou's mana that he would experience in Aotearoa. As he neared the beach of Whangaparāoa, a whale had stranded upon the shore. He prepared some cordage to tie the whale together for him. The tail of the whale was tied together and the whale was dragged ashore, where the locals used their flint-knives to divide it up. Taikehu ascended this fish. Pou called out to leave his fish alone. An argument ensued and Taikehu said, "If you don't mind can you please turn your fish over?" Once the whale was turned over, he then said, "Where is the lower jawbone of your fish?" Pou saw that the jawbone had been removed. Taikehu said, "Here is the jawbone of my fish". Pou said, "Divide up your fish, but not the place where my line is fastened". The place where this quarrel took place, near Te Akau, was known as Te Herenga-o-te-ika-o-Poumātangatanga - Kauaetangohia, from that time onwards to this current generation.

This was the second time Pou suffered a reversal. Pou decided to leave Whangaparāoa for Maraenui to the west, but before he left he stated to his relations what had transpired between himself and the atua, Rehua. He explained that Rehua had agreed for Poumātangatanga to choose one of his children. Out of all the fish in the sea, Pou chose the moki. With that selection, Rehua gave him four tikanga to uphold:

1. Kaua e haua ki te rākau – Don't hit it with a stick.
2. Kaua e kai otatia – Don't eat the moki raw.
3. Kaua e tunutunutia i tātahi – Don't cook it on the beach.
4. Ka mau te moki tuatahi, me whakairi ki te rātā, arā, te rākau a Pou hei koha ki a Rehua – When the first Moki is caught it is first scaled, with the guts intact and then it is hung by the tail to allow the spittle to drip from the mouth in the rātā tree called the tree of Pou²³⁵ as a gift for Rehua.



Whakaahua 4: Kaiwhakaahua: A. Skipper – Moki and Ruakapanga - Kauaetangohia Marae

Pou told them that if you mistreat Rehua's child, it will return and never come back (Moana Waititi, 1960, pp. 42-43). Each year, during month of June, the moki start to migrate to the moki fishing grounds at Whangaparāoa²³⁶. The reason that date is used

²³⁵ Roka Paora, John Waenga, Arthur Waititi personal communication 25 May 2005. I asked them if the rātā still stands. They replied that it did not.

²³⁶ The moki fishing ground names are as follows: Pakaru, Ōtamaroa, Tuapapa, and Kokohura.

is because the star Whānui²³⁷ (Vega) appears rising in the east signalling that the Moki is about to arrive at Whangaparāoa (B.Tāwhai, personal communication, 8 April 2009).

According to Arthur Waititi there was another star that let his people know that the moki season was imminent, and that was when Autahi (Canopus) was seen rising above Tihirau (A.Waititi, personal communication, 25 May, 2005):

Arthur Waititi: He whetū anō tō mātou, he tohu, he tohu...mō te moki. Ko Autahi te whetū – We have another star, it's a sign, it's a sign...about the moki. Canopus is the star.

Bill Tawhai: The whole moki fishing industry is dependent on the appearance of that star. Even to the spiritual side.

Arthur Waititi: When it appears in the east, it appears early, bright as anything. When every other star is gone out its still there.

Bill Tawhai: He aha ngā kōrero a Autahi? He aha tana kōrero ki a koutou? What is there to say about Autahi? What is his words to you?

Arthur Waititi: Kei te momona te moki!!! That the Moki is fat!!!

Roka Paora: Kua tae mai, kua tae mai! That it has arrived! That it has arrived!

Bill Tawhai: Kua tīmata te whakatika ki te haere, ki te hī moki! Preparation for its imminent arrival has commenced, to fish for the moki!

Arthur Waititi: Kua tae mai rā, koinei te āhua. That it has arrived, that's what its saying.

Emma: Autahi, koirā te heteri o te kete. Kite rā tātou koirā te ingoa. Autahi te heteri o te kete. Te mutunga rā its all about the stars. Autahi, that's the kit handles. If that is seen, that's its name. Autahi the kit handles. In the end...

Bill Tawhai: Well this is a famous star in Te Whānau-a-Apanui stories – Autahi because it ties in with the story of Poumātangatanga²³⁸ mai katoa...right back to Hawaiki and right back to the tamaiti taperu te ngutu – the child with the pouting lips.

Arthur Waititi: Tae atu ki a Whioreore me I-waho-rā. Including Whioreore and I-waho-rā.

Bill Tawhai: It ties in the whole mythological tradition and history of Te Whānau-a-Apanui. It depends on Autahi. Its appearance marked the beginning of the period. He tohu kua tīmata – it's a sign that its begun, e kī rā a Arthur, kua momona te moki – like Arthur said, the moki are fat. And then the whole industry rolls into operation. Kua haere ngā kōrero. In our younger days its not done today, but the first moki is sacrificed. I don't know if they still do it. No...

Once Poumātangatanga finished explaining Rehua's lore, he left with his wife Ohinemotu and his son Hekopara for Maraenui and settled there near the banks of the Mōtū. Not long after this his son went missing, presumed drowned. Being a tohunga, he asked Tangaroa if he had taken his son. There are mixed views; some say Tangaroa

²³⁷ Don Edmonds states that preparations are made for moki fishing expeditions after seeing the rising of the star Takirau over the summit of Kakanui Hill.

Source: https://www.ngataonga.org.nz/collections/catalogue/catalogue-item?record_id=229548

²³⁸ Ruamoengārara left from Puketapu on his taniwha, Tū-tehihi, Tū-te-wawa and Tū-te-takawerangi. He returned to Hawaiki to get Pou. And it was Pou who asked the god Rēhua to give him the moki.

admitted taking his son for his own purposes (B.Tāwhai, personal communication, 8 April, 2009). On seeing the immense grief that Pou showed losing his son, Tangaroa offered a gift in return to Pou. Tangaroa said to Pou that when the dust of the rarauhe (*Pteridium esculentum* - bracken) flew and the berry of the karaka turned a golden colour, the kahawai will return to the Mōtū River. Tangaroa stated that Pou and his people could take as much as they liked until the kōwhai rains²³⁹ fell in the mountains to wash the blood of the kahawai clean from the Mōtū. Hence the kahawai like the moki is viewed as 'te ika tapu' or 'the sacred fish' of the Te Whānau-a-Apanui people. Emma Rogers, Monita Delamere's sister, explains how they still follow tradition within the rituals of the Ringatū hāhi by catching the first kahawai and dedicating it to Pou:

Emma: Tika tā te Wīremu rā, I'll talk about ourselves and the 'pure', kei te mau tonu i te ika kotahi. They go and give that fish to say thanks for bringing it back to us. And they have a tohu on the karaka²⁴⁰ or when the rarauhe is brown, kua tae mai nā, kua hoki mai ngā ika. But this year like Bill its just a few, they must be getting sick of all the people at Maraenui. Ka tohutohu kia haere mai ngā ika. Kei te rite tonu ngā tohu – he rite tonu ngā tohu? Wīremu: Kei te rite tonu ngā tohu! Ko ngā ika kua kore i reira. Kei te mau tonu ngā tohu o ngā tīpuna. Kia ū a te karaka, kia mōhou te rarauhe. (Emma Rogers Delamere personal communication, 25 May 2005).

Now Timi Waata Rīmini (Rīmini, Davies, & Tregear, 1901, pp. 185-188) insinuated that Tangaroa lied to Pou, saying he had not taken his son. Nevertheless, Pou invited Tangaroa to his son's tangi. When Pou returned to Maraenui, he instructed the people to weave an enormous kūpenga, a seine net. A massive shoal of kahawai transported Tangaroa during the summer months to the tangihanga at Maraenui. At a prearranged signal, Pou instructed his people to cast their net, catching thousands and thousands of kahawai. These fish were caught and cooked to feed those who had arrived to pay their respects for Pou's son. The tradition that evolved **after** the loss of Hekopara was a son of a chief is sent out to catch three kahawai; one is offered to Poumātangatanga, the next to Kohinemotu, and the last offered to Te Wharau. Te Whānau-a-Apanui have always believed that adhering to these rituals, the fertility and abundance of the kahawai was assured.

²³⁹ Kowhai floods occur late in March – Wīremu Karuwihā Tāwhai, personal communication, 2005.

²⁴⁰ When the karaka is ablaze in bright fruit, the kahawai returns to spawn. I ngā raumati, kua ura te karaka, kua hokihoki mai ngā kahawai ki te whakawhānau mai i ngā hēki. I ngā rā o mua, hukahuka te moana i te tere kahawai.

The Ringatū faith helped to reinforce the importance of these Te Whānau-a-Apanui fishing traditions as Whaea Emma alluded in the above quote. These days, when Matariki is seen rising in the northeast, Te Whānau-a-Hikarukutai, the hapū at Maraenui, places a rāhui at the mouth of the Mōtū River to stop any fishing of the kahawai in order to allow the kahawai to spawn. It marks the end of the Ringatū planting season known as Huamata. On November 2nd, the rāhui is lifted and the opening of the kahawai fishing season, Te Pure commences until June 1st. The river is closed every Saturday, every tangi and on the 12th of every month. Another important practice is the strict prohibition of filleting and gutting near the river. Rikirangi Gage reinforced the importance of this pūrākau by stating that his tīpuna had 'treaties' with Poumātangatanga and Tangaroa:

Ko ngā kōrero o te taiao me kī tētahi waonui, kōrero taiao mō ngā hau, mō ngā ngarunui me te noho te ira tangata i te taha o ...me kī te taha o te ao atua. Whakaatungia rātau, kei reira tonu a mātau tīriti haere ana i waenganui ngā pakeke, waenganui a Poumātangatanga me Tangaroa tērā tīriti anō. Ana ko te hua i puta i ērā o ngā kōrero ko ngā tikanga i mau nei e mātau. Nō reira, he pai kia whao ērā ki roto i te waiata i te mea, ko te kōrero ka haere toutou ki tērā reanga. Tō tātau iwi, koinei te wānanga tuatahi ki a rātau, ko te āta noho, ko te āta whakaaro tēnei mea te taiao. He aha i patu ai te ika? He aha i puta mai te kahawai...konei. Arā kē ngā mauri, arā, ka rongo ko Hinemotu (Gage, 2018).

There are stories of the environment, which is very important. The winds and the waves and the connection between mankind and the world of the gods. They were revered. We still have treaties between our ancestors, Poumātangatanga and Tangaroa. So the benefits of the story for us are the customs we possess. So its good to incorporate them into songs because the stories that go with it, are lessons for this generation. Our people, this was their way of teaching us to respect the environment. Why are fish killed? Why did the kahawai come here? Its all therein the stories of Hinemotu.

Although the moki and the kahawai pūrākau initially involved Tainui tīpuna, it has become a distinctive part of the Te Whānau-a-Apanui worldview. The whakapapa link shown in Tepū 8.4 from Ranginui-a-Tamaku and Papatūānuku down to Poumātangatanga and then down to Apanui Ringamutu, including Apanui's two wives Whaaki and Te Kohepare from Tōrere, a daughter of Hoturoa, connects the current generation of Te Whānau-a-Apanui through time and space to the deep sense of responsibility that Poumātangatanga received after his kōrero with Rehua.

Waititi's kōrero reveals the skills required for a migrating crew to settle in a new land. It also shows that tamariki were trained and expected at a young age to know how to

protect themselves and how to read local weather, tidal and astronomical conditions in order to survive.

2. Te Ao Wairua - Spiritual World

Like many other iwi, Te Whānau-a-Apanui are very spiritual people. They are a humble people who feel, through their cultural practices, a close spiritual connectedness to their atua, and to their tīpuna. Karakia are conducted before anything of a significant nature is started to ensure that they remain connected to that spiritual element. The daily weather played a huge part in their lives. One of the participants explained that looking out for tohu was a daily occurrence. It started in the early hours before sunrise and continued until after sunset. All the physical tohu that their pakeke knew were taught to them to ensure they remained safe, especially when violent storms were about to strike their communities. They said that they felt it in a spiritual way, and that it was an 'age-old' feeling, a feeling of connectedness. Some may argue that the weather, in relation to their spiritual awareness and their environment, defined them, moulding them into the people they are today. Elders of Te Whānau-a-Apanui who were matakite²⁴¹, recognised tohu mate or tohu aituā²⁴² that manifested in peculiar weather phenomena such as incomplete rainbows, or thick soupy fog gathering on a peak or headland.

During my youth I remember watching a very thick fog building up above Pokohinu until it forced its way down past Te Ana-o-Hinerangi and flopped into the moana. I watched as the fog encircled the Omaio Bay. I remember feeling the air crackle; then boom, thunder and lightning rolled along the ranges. A wind started to pick up from the south and grow in intensity, then a torrential downpour followed, catching me out totally on the beach by the Tokamaii²⁴³ rock. A beloved kuia passed away not long after that; her name was Kawa Ingarangi Huritū²⁴⁴.

²⁴¹ Seer or clairvoyant

²⁴² Signs of impending death

²⁴³ Tokamāia. A rock located at Omaio. Tokamāia is the proper name not Omaio

²⁴⁴ She married Nani Pita Huritū. Her first husband was my great grandmothers (Ngareta Hati) brother Hati Hati. When my grandmother Maraea Te Au passed away giving birth to twins, Nanny Kawa brought my father, his tuākana, tāina and tuahine up. I also lived with her in Taita – Wellington. She was a staunch

Many of our participants said as they had got older they tended to notice when something was not right, even when they thought initially that it was a good sign:

Now another of those things you mentioned the ring around the moon. Now could've been around about the same time, I looked out the window and there were two rainbows²⁴⁵, you know the sun had set. And we started to put on the lights, and I thought good gracious, they were about a couple of metres apart but they were brightly coloured...I've never seen rainbows like that so intense. So I rang next door and they asked what's that a sign of nana. I said that it was a good sign. But it might've been like that Matatā tragedy you're talking about. Two rainbows, brightly coloured, you know of all these things we've never seen all our lives. And now Hopaea sees the ring around the sun. And Emma sees something coming out of the moon. And me with two rainbows after dark, brightly coloured (Roka Paora, personal communication 25 May 2005).

Senior Te Whānau-a-Apanui kaumātua, Danie Poihipi described a tohu mate that is only witnessed at Omaio; it is known by the locals as Pariwaitoka-o-Wharawhara. When I described what I saw in my youth on the beach at Omaio, he said you've seen it - Pariwaitoka-o-Wharawhara. He spoke further, saying that when the pakeke saw this they knew that someone significant within the community was about to pass away. He said that this phenomenon is the land weeping for that person. Tāwhai disclosed another tohu aituā connected to Te Whānau-a-Rūtaia:

Some rains give you that sign. Nō māua tētahi kupu i a au i tipu ake i roto o Otūwhare ānei: Kua rongo koutou i tēnā? Parewaikohu. Kōrero ai ōku pakeke i runga i te pae, ka tiro ake ki muri; eh kei te haere te parewaikohu. And the parewaikohu as you can see from this word feather, is feathery intermittent [rain]...very, very light...its in this category here. Ko te parewaikohu kua tiro tiro rātau, kua māharahara...because its passing across the hills in feathers, in series. Kua kite tonu koe i ngā maunga i muri i a mātau kāinga e haere ana te marangai rā but its in series. Like feathers, like moist feathers brushing across the hill sides(B.Tāwhai, personal communication, 25 May 2005).

Tāwhai provides a deeper understanding based on what his pakeke said. He explained that the feature of this special type of feathery light, veil-like rain falling at the back of the marae, made them feel uneasy as they knew that it was a bad omen, usually meaning that someone close was about to die.

Ringatū follower, knowing all the karakia and waiata. She was also knowledgeable in the arts of healing, the use of rongoā and an expert weaver.

²⁴⁵ In a previous interview with Te Kahautū Maxwell he talked about witnessing double lunar rainbows with his whanaunga and mentor Sir Monita Delamere, Emma's tungane, when they travelled from Whitianga to Mt Eden Prison to exhume Mokomoko's remains. Monita saw these as tohu aituā.

I have thought long and hard about what I have heard as a kid, what I was told by my father. I remember him standing outside Nanny Kawa's kāinga at Little Awanui on a cloudless, fine day. Light rain fell from out of this sky. I looked up and said to my father, "that's unusual there's no clouds...where's the rain coming from?" My father shocked me by replying, "Someone's died!" There are many other *tohu mate*, *tohu aituā*, like albino stingrays arriving in twos or threes, but they are not relevant to this kaupapa.

To reiterate, this strand of knowledge and practice is an important point of difference to that of mainstream Pākehā knowledge. A fundamental difference with MEK is that it has a very strong spiritual element. This is knowledge that my elders accepted and fully embraced; knowledge that demonstrated the close, intimate relationship between Te Ao Kikokiko²⁴⁶ and Te Ao Wairua²⁴⁷. In Tēpu 8.5 are examples of Te Whānau-a-Apanui *tohu mate* or *tohu aituā*. The indicators for either signs of catastrophe or death are identified along with a description and the name of the contributor:

TĒPU 8.5: NGĀ TOHU AITUĀ ME NGĀ TOHU MATE – SIGNS OF CATASTROPHE AND DEATH

NGĀ MOMO TOHU TYPE OF INDICATOR	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
HAU-PĀPĀRINGA Light breeze	A breeze that caresses the cheek. "He haurekereke ngā tamariki a Tāwhiri-mātea."	Iwi: Te Whānau-a-Hikarukutai, Te Whānau-a-Apanui Takiwā: Maraenui Kaikōrero: Danie Poihipi
HOTINGAMANU Fog	Another name of a <i>tohu mate</i> for Te Whānau-a-Nuku. Thick fog gathering on top of Pokohinu.	Iwi: Te Whānau-a-Hikarukutai, Te Whānau-a-Apanui Takiwā: Maraenui Kaikōrero: Danie Poihipi
KAPUA PANGO Black cloud	There was a black cloud hanging over the mouth of the Mōtū River before the tragic drowning of 16 school children and two adults. A koroua was heard repeating, "He kino kai te haere!"	Iwi: Te Whānau-a-Tūtawake, Te Whānau-a-Tūwahiawa, Ngāti Paeakau. Takiwā: Whitianga Kaikōrero: Emma Rogers

²⁴⁶ Physical world

²⁴⁷ Spiritual world

<p>MARANGAI KĒHUA Spiritual Rain</p>	<p>During a tangihanga, torrential rain fell, accompanied with galeforce winds. It was noted by the pakeke in the tipuna whare at the time that it was no ordinary storm. A continuous loud rapping sound hit the outside of the walls of the whare, going round and round all night.</p>	<p>Iwi: Te Whānau-a-Rūtaia, Te Whānau-a-Apanui Takiwā: Omaio, Otūwhare Kaikōrero: Wīremu Tāwhai</p>
<p>PARINUJ Fog</p>	<p>A tohu mate for Mere Mahaki. When thick fog is seen spilling down from the Maraenui peak she knows someone has passed away from Rākaunui – Kāwhia Moana. When she observed the fog falling down she would say, “He mate tōku kai te kāinga.” Mere is the eldest sister of Te Ata, she is related to the Koroheke whānau from Ngāti Maniapoto, Ngāti Apakura.</p>	<p>Iwi: Te Whānau-a-Hikarukutai, Te Whānau-a-Apanui Takiwā: Maraenui Kaikōrero: Danie Poihipi</p>
<p>PARIWAITOKA-O-WHARAWHARA Fog, whirlwind, thunder, lightning, torrential rain</p>	<p>The tohu mate is only seen within the Omaio Bay, nowhere else. It starts off on a fine day with thick soupy fog gathering on top of Pokohinu Pt, which flops into the moana encircling the whole bay. It then reconnects with the mainland near Motunui. The fine day quickly starts to darken, the fog on the moana thickens up and then starts to move. Thunder and lightning cracks along the ridges behind Otūwhare Marae. Wind starts to blow, growing in intensity; a torrential downpour follows. It is said that the whenua is mourning the imminent passing</p>	<p>Iwi: Te Whānau-a-Hikarukutai, Te Whānau-a-Apanui Takiwā: Omaio Kaikōrero: Danie Poihipi</p>

	of leading person within the Te Whānau-a-Rūtaia and Te Whānau-a-Nuku hapū.	
PARIWAIKOHU Light rain	Spiritual rain passing across the hills like birds' feathers – falling in phases.	Iwi: Te Whānau-a-Rūtaia, Te Whānau-a-Apanui Kaikōrero: Wīremu Tāwhai
PŪNEHUNEHU Light rain	Light rain falling out of clear blue sky during summer.	Iwi: Te Whānau-a-Apanui whānui Kaikōrero: Apanui Skipper Snr
REHITA Lunar rainbows	<ol style="list-style-type: none"> 1. Te Kahautū Maxwell witnessed double lunar rainbows with his whanaunga and mentor Sir Monita Delamere, Emma's tungane, when they travelled from Whitianga to Mt Eden Prison to exhume Mokokoko's remains. Monita saw these as tohu aituā as the lunar rainbows were not fully formed. These rainbows stayed with them until they reached Te Kaokaoroa past Matata. Te Kahautū heard Monita conducting karakia most of the way to Tāmaki. 2. Roka shared how she had seen two vivid-looking lunar rainbows outside her window just after sunset. She said it was so unusual, as the colours of the rainbow were so intense. The Matata tragedy occurred not long after this in May 2005. 3. Lunar rainbows seen as a tohu wairua. When seen you know it's a warning to be vigilant, to be careful. 	<p>Iwi: Te Whānau-a-Tūtawake, Te Whānau-a-Tūwahiawa Te Whānau-a-Apanui.</p> <p>Kaikōrero: Te Kahautū Maxwell</p> <p>Iwi: Te Whānau-a-Maru, Te Whānau-a-Pararaki - Te Whānau-a-Apanui whānui</p> <p>Kaikōrero: Roka Paora</p> <p>Iwi: Te Whānau-a-Tūtawake, Te Whānau-a-Tūwahiawa, Ngāti Paeakau, Te Whānau-a-Apanui</p> <p>Takiwā: Whitianga</p>

		Kaikōrero: Emma Rogers
TAMAKITEKAPUA Thick fog	A tohu mate for Te Whānau-a-Hikarukutai. Thick fog gathering on top of Tamakitekapua peak.	Iwi: Te Whānau-a-Hikarukutai, Te Whānau-a-Apanui Takiwā: Maraenui Kaikōrero: Danie Poihipi
TŪĀHU Lightning strikes a mountain peak	Is the name of the hill which runs westerly from Kakanui to Moaha behind Waiorore. It is there where the lightning strikes at Te Kaha. When the flash is seen upon that hill it is a sign of the death of a chief, and is known as a rua kōhā. Mere composed a waiata tangi for her husband Te Whatu-a-Rangahua. Here is the text from the lament: “Tērā te ūira hiko tapatahi ana rā runga o Tūāhu; ko te tohu o te mate i tukua atu nei”. <i>“The lightning flashed once on the summit of Tūāhu; ‘twas the sign of him now departed”.</i>	Iwi: Te Whānau-a-Hinetekahu, Te Whānau-a-Apanui Takiwā: Waiorore Ahunga: Mere Reweti Taingunguru (Ngata, 2005, pp. 60-63).
ŪENUKU Rainbow	One should never go through the centre of the rainbow. Many would stop, then conduct karakia before travelling on when a rainbow was seen close by.	Iwi: Te Whānau-a-Kauaetangohia, Te Whānau-a-Apanui. Kaikōrero: Addie Waititi
TOTAL - 12		

3. Ngā Maumaharatanga - Memory Techniques

Te Whānau-a-Apanui hold a vast store of environmental knowledge within their language, histories, and cultural practices. Local history, laments, tribal proverbs, and place names were all mnemonics or memory techniques used to mark in time the devastating impacts extreme weather events can have on a community. For example, changing tribal names after the drowning of school children is another powerful tool that was used by First-nations peoples like Te Whānau-a-Apanui to ensure that future generations did not forget the lessons learnt after experiencing tragic loss of life.

Te Whānau-a-Nuku changed its name to Ngāti Horowai, meaning swallowed by the water. The hapū from Whitianga changed its name from Te Whānau-a-Tūwahiawa to Ngāti Paeakau, meaning cast along the shore; and the hapū at Maraenui changed its name from Te Whānau-a-Hikarukutai to Ngāti Horomoana, meaning swallowed by the sea. This powerful act of changing the name of ones hapū was driven principally by Te Whānau-a-Apanui elders’ decision not to remain complacent but to be proactive in order to remember the tragic consequences of underestimating the hazard of crossing a swollen river like the Mōtū.

Ngā Whakataukī - Proverbs

Like many other iwi, Te Whānau-a-Apanui tīpuna composed many whakataukī to encapsulate the morals and values that they stood by as a people. Whakataukī were a useful tool to curb undesired behaviour and to encourage and aspire to higher principles and standards. Being usually short and succinct, they were used as a method to teach and reinforce complex lessons, like understanding weather and climate knowledge, by making them easier to retain. Tēpu 8.6 offers 15 examples that uphold Te Whānau-a-Apanui ideals along with a Pākehā translation and meaning.

TĒPU 8.6: NGĀ WHAKATAUKĪ – TRIBAL PROVERBS

NGĀ WHAKATAUKĪ TRIBAL PROVERBS	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
He ngaronga toati, he toronga taratara tūtū - <i>The cross beams of the boat disappear, the erect back fins pierce.</i>	This was a saying of Te Whānau-a-Apanui fishermen who followed the maramataka. The Ōtāne lunar night was part of a seven-day fertile period, which these fishermen used to the best of their abilities to catch abundant numbers of kahawai, hapuka, tarakihi, or other fish. Fish were very easily caught during these times, so much so that it didn’t take long before your waka was full to the brim. You needed to be careful though with a boat load of fish	Hapū: Te Whānau-a-Rūtaia, Te Whānau-a-Apanui Ahunga: Tāwhai, 2013, p. 37

	<p>otherwise you could get hurt by being spiked by the many erect back fins. Te Whānau-a-Apanui kaumātua advised and encouraged their people that this seven-day fertile period from Tangaroa-ā-mua to Ōmutu this was a time for concerted, organised action to plant, to dive, to torch for tuna, to gather crabs and pūpū and to put out crayfish pots – make use of this of this window of opportunity.</p>	
<p>Ka puawai te kōhai, ka tere te mārearea - <i>When the kōhai are flowering the whitebait are running.</i></p>	<p>A Te Whānau-a-Apanui seasonal indicator that let the coastal communities know that the mārearea (whitebait) were ready to be harvested.</p>	<p>Hapū: Te Whānau-a-Ēhutu Kaikōrero: Hopaea Ngātoro</p>
<p>Ka pūawai te pōhutukawa, ka patero te kina - <i>When the pōhutukawa flowers, the kina breaks wind.</i></p>	<p>A Te Whānau-a-Apanui seasonal indicator that let the coastal communities know that the kina was fat and ready to be harvested. Pōhutukawa (<i>Metrosideros excelsa</i>) grow prolifically along the Te Whānau-a-Apanui coast, therefore the biological indicator provides a very clear signal.</p>	<p>Hapū: Te Whānau-a-Marū, Te Whānau-a-Pararaki Kaikōrero: Roka Paora</p>
<p>Kai te mau potae a Tihirau! – Tihirau is wearing a hat!</p>	<p>At a Māori environmental knowledge of weather and climate wānanga with Te Whānau-a-Apanui held at Te Wānanga o Awanuiārangi on 25 May 2005, Darren King asked if anyone knew any indicators regarding mountains. Wiremu Tāwhai said, “<i>The best people to talk with are the people that live below Tihirau. The</i></p>	<p>Hapū: Te Whānau-a-Rūtaia, Te Whānau-a-Kauaetangohia Kaikōrero: Wiremu Tāwhai and Arthur Waititi</p>

	<p><i>well-known maunga of Te Whānau-a-Apanui and those are the guys that live underneath it. They know exactly what Tihirau is telling them about the weather.”</i> Arthur Waititi, a kaumātua from Whangaparāoa, Te Whānau-a-Apanui responded after Wīremu Tāwhai, <i>“it never fails, if it’s got a hat on its going to rain. Even when its sunshine. Where the clouds come from I don’t know.”</i> Arthur Waititi and John Waenga talked about two weather trees (Pōhutukawa) that grew on Tihirau. They are called Whīoreore and I-waho-rā. Local history states that two weather experts who came across on the double-hulled canoes were turned into these Pōhutukawa trees.</p>	
<p>Kai te puehu te pae, he hau tonga kai te haere - <i>When the horizon is dusty, a southerly follows.</i></p>	<p>The indicator is a dusty-looking disturbance located along the ocean horizon due north. When the Te Whānau-a-Apanui people noticed this tohu out to sea they knew that a southerly was coming. The southerly rises high above the Raukūmara Ranges and then descends well out to sea, ripping the surface of the moana up, creating that dusty-looking condition. But in a few days’ time the southerly will start to weaken and start dropping in height, hitting the coastline in about 3-4 days. Mist forming along the coastline, especially near the mouth of a river, was another indicator that was noticed when a southerly was about</p>	<p>Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai</p>

	to hit. The cold temperature of the fresh water mixing with the warming sea water, coupled with the southerly striking the coast would cause the fog to form.	
<p>Kia pā te rā ki te pae kia whakatātare mai te marama i runga i ngā pae maunga, kia kī mai te tai i te ahiahi. Koiana te marama kī tūturu -</p> <p><i>When the sun touches the horizon in the evening, when the moon peers over the hills and the tide is at its fullest. That is the fullest of the full moons.</i></p>	<p>Te Whānau-a-Apanui have a procedure to ascertain when the moon is at its fullest, thus determining which night is truly Rākaunui, which is the first lunar night of the Te Whānau-a-Apanui maramataka. They would use a triangulation method. These three aspects had to be happening at the same time:</p> <ul style="list-style-type: none"> i. A setting sun touches the western horizon. ii. A rising full moon over the Raukūmara Ranges behind them, and; iii. A high tide (highest tidal measurement using a peg system) <p>The Te Whānau-a-Apanui elders did this every month to recalibrate the maramataka, ensuring that it remained accurate and correct to the teachings that had been entrusted to them.</p>	<p>Hapū: Te Whānau-a-Rūtaia Ahunga: Tāwhai, 2013, p. 17</p>
<p>Koia nā te āhua o ngā Tamatea-kai-ariki, o ngā Tamatea-tūhāhā. Tiro atu e huri nā te puku o te moana. Koiana te mea motuhake o ngā Tamatea nei. Ka</p>	<p>Wīremu Tāwhai recounts a vivid memory of his grandfather Timutimu Tāwhai sitting on the veranda looking out to the moana and talking to him about his observations and the ‘freakish’ sea conditions experienced during the Tamatea nights of the Te Whānau-a-Apanui</p>	<p>Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai</p>

<p>kōrori, ahakoa ko te kaupapa tonu o te moana - <i>That is what Tamatea-kai-ariki and Tamatea-tūhāhā is like. See how they churn up the stomach of the ocean? That is what is special about Tamatea-kai-ariki and Tamatea-tūhāhā. See how the very bowels of the ocean are in convulsions.</i></p>	<p>maramataka. When the mokopuna asked his grandfather how he knew this, he replied that this is what his father and his grandparents taught him and his people. Nobody would go out to dive, fish or conduct any type of activity during the Tamatea nights.</p>	
<p>Kai te apu wai te marama - <i>The moon is swallowing water.</i></p>	<p>During the first five lunar phases of the month, if a crescent moon was seen lying on its back the Te Whānau-a-Apanui people would exclaim, 'kua apowai te marama', meaning it was holding water and therefore a dry month was predicted for the that month.</p>	<p>Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai Ahunga: Tāwhai, 2013, p. 43</p>
<p>Kai te riringi wai te marama - <i>The moon is tipping water till it stops.</i></p>	<p>During the first five lunar phases of the month, if a crescent moon was seen standing upright, the Te Whānau-a-Apanui people would exclaim, 'kai te riringiwai te marama', he marama tino mākū. Meaning a very wet month was expected.</p>	<p>Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai Ahunga: Tāwhai, 2013, p. 43</p>
<p>Mā te haruru o te ākau, he āwhā kai te haere - <i>When the reef booms, a storm is on its way.</i></p>	<p>All along the Te Whānau-a-Apanui coastline, the elders taught their people to know how to anticipate extreme weather. They taught them how to determine the sounds of the</p>	<p>Hapū: Te Whānau-a-Rūtaia, Te Whānau-a-Kauaetangohia Kaikōrero: Wīremu Tāwhai, Arthur Waititi</p>

	surf striking the reefs and the coastline from rainfall or a storm to nothing at all.	
Ngā tai whakakī o te Rākaunui - <i>The filling tides of Rākaunui.</i>	In reference to one of three Te Whānau-a-Apanui methods of recalibrating the start of the Te Whānau-a-Apanui maramataka. Kaumatua, Wīremu Karuwhā Tāwhai (Te Whānau-a-Rūtāia - Te Whānau-a-Apanui), explained that the first lunar night that most hapū-iwi throughout the motu start with is Whiro, but Te Whānau-a-Apanui lunar month starts with Rākaunui.	Hapū: Te Whānau-a-Rūtāia Ahunga: Tāwhai, 2013, p. 18.
Taku waha kai marangai ki roto o Māiaiti; taku waka tē toia, tē haumatia - <i>My mouth ate in stormy weather at Māiaiti; no canoe was launched, no shouting.</i>	Kōhere provided a better translation: <i>'My mouth always satisfied at Māiaiti, Rough though the weather might be, Where no canoe need be launched' Nor a voice is heard to urge.'</i> Tangitāheke, a chief who was related to both Ngāti Porou and Te Whānau-a-Apanui visited those iwi he learned how during stormy weather, pools might be fished so that seafood was always plentiful. Later, however, at Whakatāne where no such fishing could be carried out during bad weather, this pepeha was his comment.	Ahunga: Brougham, 1975, p. 44; Kōhere, 1951, p. 22; Williams, 1908, p. 13.
Tēnā ngā hau nō Tarawera, hei rutu i a koe, kia hinga ki raro rā; he hau popoki iho nō Parahaki, e tū noa mai rā - <i>There are the winds of Tarawera to</i>	The Tarawera winds represent the Ngāi Tai forces ranged against Te Whānau-a-Apanui resulting in the death of Paora Ngāmoki snr in 1864 at Tunapahore.	Ahunga: Ngata & Mead, 2007, pp. 176-177.

<i>knock you down, and you did fall down; a whirling wind blew me from Parahaki, that stands lonely over there.</i>		
Titiro atu, ko Whiro tērā e whakataretare mai rā i te pae, e kimi raruraru ana. Kaua rawa e tukuna kia mau koe i te ringa taumaha, i te ringa kōtē o Whiro. Ka taka te raruraru ki runga i tō mahunga – Look at him! Look at Whiro lurking about the horizon, looking for the chance to make trouble. Take extra care. Do not let the draconian hand of Whiro take hold and bring ill-fortune upon one’s head.	Early morning after Mutuwhenua or Takatakapūtea Te Whānau-a-Apanui elders would rise to look for the appearance of the new moon. They observed the sliver of the new moon rise fractionally above the horizon, hang suspended for a while, and then disappear. They are then heard to make these utterances.	Hapū: Te Whānau-a-Rūtaia Ahunga: Tāwhai, 2013, p. 51
TOTAL - 15		

Ngā Wāhi Ingoa - Place Names

In Tēpu 8.7 only eight place names were identified suggesting that much of the knowledge pertaining to place names had been lost or is still retained by other whānau. As previously explained, place names represent some of the earliest hazard prevention tools for Māori, Te Whānau-a-Apanui are no different. It also signals that there is more investigation needed. Relative place names are identified, followed by a brief meaning and location.

TĒPU 8.7: NGĀ WĀHI INGOA – PLACE NAMES

NGĀ WĀHI INGOA PLACE NAMES	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
AOPARAURI	‘Dark cloud’. A peak near Whanokao maunga	Hapū: Te Whānau-a-Pararaki Takiwā: Raukōkore
KAPUARANGI	‘Overcast day’. 853m high peak south of Taumata-o-Apanui	Hapū: Te Whānau-a-Harāwaka Takiwā: Tunapahore
MAKARIRIHAU	‘Chill wind’. Name of a stream connected to the Raukōkore River.	Hapū: Te Whānau-a-Maru Takiwā: Raukōkore
PŪANGIANGI	‘Cool breeze’. Peak south of Whanarua	Hapū: Te Whānau-a-Kahu Takiwā: Whanarua
RANGIPOUA	‘Raised up sky’. One of the sacred peaks of Te Whānau-a-Apanui, located between the Hāparapara and the Waikakariki Rivers.	Hapū: Te Whānau-a-Rūtaia Takiwā: Hāparapara
TE RANGINUI	‘Expansive sky’. Located near Waihou Bay.	Hapū: Te Whānau-a-Pararaki Takiwā: Waihou
TE RANGIHARU	‘Resounding sky’. Bay opposite Waihou.	Hapū: Te Whānau-a-Parahaki Takiwā: Waihou
WAIHAU	‘Windy water’. Describes the exposed location of Waihou to the elements.	Hapū: Te Whānau-a-Parahaki Takiwā: Ōrete
TOTAL - 8		

Ngā Waiata Tangi – Laments

Te Whānau-a-Apanui composed many waiata tangi²⁴⁸ to mark the passing of their dead and also to remember the way they died. Waiata are excellent ways of keeping particular types of memory alive to ensure that one does not forget (see Te Ao Wairua section). Like many other iwi, Te Whānau-a-Apanui used weather phenomena as a metaphor to capture the depth of utter loss. Tēpu 8.8 therefore gives three waiata tangi as examples that described the death of the deceased and some instances their deaths were foretold in the sky, you only had to look upwards. Ngā Mōteatea were primarily used to identify relevant content to weather.

²⁴⁸ Dirges, lament

TĒPU 8.8: NGĀ WAIATA TANGI - LAMENTS

NGĀ WAIATA TANGI	HE WHAKAMĀRAMA	IWI TAKIWĀ AHUNGA KAIKŌRERO
TRIBAL LAMENTS	EXPLANATION	NATION AREA SOURCE INFORMANT
<p>Tērā Matariki huihui ana mai. Ka ngaro rā, ē, te whetū kukume ata – <i>Behold the Pleiades are clustered above. Lost, alas, is the star that hauls forth the dawn</i></p>	<p>Mere composed this for her husband, Te Whatu-a-Rangahua, who was killed at Tokakuku, Te Kaha. When Matariki is seen low lying above the eastern horizon, it is only seen for a short period of time before disappearing within the rising sun. To say that Matariki is lost signifies a calamity has happened.</p>	<p>Iwi: Te Whānau-a-Te Ēhutu, Te Whānau-a-Apanui Ahunga: Ngata, 2006, pp. 60-61 Ngā Mōteatea Part II Takiwā: Te Kaha Kaitito: Mere Reweti Taingunguru Rārangi: 1-2</p>
<p>Tērā te ūira hiko tapatahi ana rā runga o Tuahu. Ko te tohu o te mate i tukua atu nei – <i>The lightning flashes once on the summit of Tuahu; twas the sign of him, now departed.</i></p>	<p>The mountain peak mentioned here is located west of Tokakuku at Waiorore. Lightning strikes hitting a sacred peak seem to be a generic sign for most iwi that a senior leader has died (see Te Ao wairua section).</p>	<p>Rārangi: 18-20</p>
<p>Whakatūtū ai te kapua i te rangi! Nāu koa rā i horo i te aitu ki – <i>The clouds are piled in the sky! 'Twas you who caused the calamity.</i></p>	<p>The subject of this waiata tangi was the loss of multiple lives. One of those killed was Te Rama-apakura of Ngāti Awa. He was killed by Tionga at Te Awa-o-te-atua. The first sentence sets the scene by providing an image of cumulus clouds that threaten possible lightning strikes.</p>	<p>Iwi: Te Whānau-a-Apanui, Ngāti Porou, Ngāti Awa Rohe: Mātaatua Ahunga: Ngata, 2007, pp. 54-55 Ngā Mōteatea Part IV, Tiwana Turi Rārangi: 1-2</p>
<p>E piki ki runga rā kia tohungia iho, ē. Whatitiri pātahi te uira i te rangi, ē. Ko te tohu o</p>	<p>Lightning strikes followed by low rolling thunder is a sign of death. In this case Te Rama-apakura and many others.</p>	<p>Rārangi: 9-13</p>

<p>te oro i haere ai koe rā; Nāu atu noa rā ki roto te ngaere rā, mō ika huirua i waho o Tumutara, ē – <i>Climb up above so that</i> <i>you will be identified.</i> <i>Thunder and lightning</i> <i>pierce the sky, that</i> <i>rumbling sound</i> <i>signalled your</i> <i>departure; that was you</i> <i>amidst the shaking,</i> <i>announcing the double</i> <i>loss beyond Tumutara</i></p>		
<p>Whakamau mai ai ki te ao e rere i runga o ‘Rangai – Fasten your <i>attention to the cloud</i> <i>passing by above</i> <i>‘Rangai</i></p>	<p>This waiata tangi was composed for the death of Te Ua-a-te-rangi, who died at Whakatāne. It was suspected that he died from mākutu</p>	<p>Iwi: Te Whānau-a-Te Ēhutu, Te Whānau-a-Apanui Ahunga: Ngata, 2007, pp. 250-253. Ngā Mōteatea Part IV Takiwā: Te Kaha Kaitito: Rāpata Roihana Rārangi: 7-9</p>
TOTAL - 3		

4. Ngā Whakarōpūtanga - Nomenclature and Classification

During the weather and climate wānanga held at Te Wānanga o Awanuiārangi, Te Whānau-a-Apanui developed a detailed language for describing and naming local weather and climate phenomena – from local nomenclature of the seasons, to classification of different types of rainfall, to the direction and character of the local winds. When Te Whānau-a-Apanui elders were asked the question, “Does anybody know the names for different types of local rainfall?” they replied no at first but after jogging their collective memories they were able to come up with 18. Many of the elders were amazed how many wind names they could remember on being given the opportunity to not only participate but improve their localised understanding about the different types of Te Whānau-a-Apanui rainfall, winds and cloud.

Ngā Wāhanga-o-te-tau – The Seasons of the Year

Unlike many nations around the world that have four seasons, Te Whānau-a-Apanui identified **six** distinctively different seasons (Tāwhai, 2005).

1. Takurua – Early Winter
2. Hotoke – Winter
3. Mahana – Early Spring
4. Koanga – Spring
5. Raumati – Summer
6. Ngāhuru - Autumn

Te Whānau-a-Apanui tīpuna have long recognised the unique climate conditions it enjoys compared to other regions. This localised knowledge allows them to grow sub-tropical fruit, such as Golden Kiwifruit before other areas in the Aotearoa due to a micro-climate.

Ngā Momo Ua – Rainfall Classification

During our wānanga, Uncle Bill described a special type of rain that arrives in late February or early March after the kahawai run at the Mōtū:

BT: Okay another exercise: he aha ētahi atu ingoa mō ngā marangai motuhake e mōhio ana koutou? He ingoa a koutou mō tētahi marangai e pā ana ki tō koutou kāinga. Māku e tīmata; e mōhio ana māua ko Emma ki tēnei ngā marangai o te kōhai. And thats a very clear description of a certain rain that happens at a certain time and at a certain place. Ka pai o mātou hapū o ngā marama o te kōhai. Now does that happen in other places? And the longer part of this story is, when the kahawai fishing is finished at the mouth of the Mōtū, and their scales, and blood are lying around on the beach, ka tatari ngā tīpuna mō ngā marangai kōhai to wash the river mouth away. So thats a special rain of my hapū. Ngā marangai o ngā kōhai which comes at the end of February, which coincides with the end of the kahawai fishing season and our tipuna interpreted it as a special rain sent to wash the mouth of the river. So thats...koirā ngā marangai o ngā kōhai ki a māua.

Uncle Bill and Emma further explained that other than the Kōhai rains, three waves known as Huaroa, Rangawhenua and Whatiwhati-raututu came to wash away the kahawai carcasses along the banks of the Mōtū River. This is only one example of rainfall in the Te Whānau-a-Apanui rohe. Tēpu 8.9 is a list of rainfall identified by the participants. Ranging from violent storms to damp air:

TĒPU 8.9: NGĀ MOMO UA – RAINFALL CLASSIFICATION

NGĀ MOMO UA RAIN CLASSIFICATION	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
ĀWHĀ	Tempest, severe storm, roaring of the wind	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAUTŌRUA	Heavy dew forms during the evening on the grass	Hapū: Te Whānau-a-Apanui Kaikōrero: Roka Paora
KOHU	Fog	Hapū: Te Whānau-a-Apanui Kaikōrero: All the kaumātua
KOHUKOHUTERE	Very light misty conditions seen in the forest associated with tūrehu	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
KŌPATAPATA	Rain shower	Hapū: Te Whānau-a-Apanui Kaikōrero: Hopaea Ngatoro
KŌUAUA	Drizzle	Hapū: Te Whānau-a-Apanui Kaikōrero: Hīria Hedley, Roka Paora
MARANGAI	Heavy rain	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
MARANGAI ĀWHĀ	Torrential downpour	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
MARANGAI KĒHUA	Spiritual rain, an uneasy rain	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
MARANGAI O TE KŌHAI	Kōhai rains: When the kahawai fishing is finished at the mouth of the Mōtū, and their scales and blood are lying around on the beach, Te Whānau-a-Apanui elders would wait for 'Marangai o te kōhai' to cleanse the river mouth by washing away all the detritus.	Hapū: Te Whānau-a-Rūtaia, Te Whānau-a-Tūtawake Kaikōrero: Wīremu Tāwhai, Emma Rodgers
MĀTURUTURU	Dripping rain	Hapū: Te Whānau-a-Apanui Kaikōrero: All the kaumātua
PAREWAIKOHU	Spiritual rain passing across the hills like birds' feathers – falling in phases	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
PARIWAITOKA-O-WHARAWHARA	Spiritual Storm – tohu mate	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
PŪNEHUNEHU	Gentle, light rain	Hapū: Te Whānau-a-Kauaetangohia Kaikōrero: John Waenga

TE HAU KŪ	Dew drops of the evening. Te Whānau-a-Apanui elders all mentioned that their mothers would say to them gather their clothes before the dew settles. Vapour in the air	Hapū: Te Whānau-a-Apanui whānui Kaikōrero: All the kaumātua
UA	Generic name for rainfall	Hapū: Te Whānau-a-Apanui Kaikōrero: All the kaumātua
UA-TERETERE	Heavy rainfall	Hapū: Te Whānau-a-Tūtawake Kaikōrero: Emma Rodgers
WHAKAMĀKŪKŪ	Light drizzle, damp air. When it falls on your skin it quickly evaporates	Hapū: Te Whānau-a-Apanui Kaikōrero: All the kaumātua
TOTAL - 18		

Ngā Momo Hau – Wind Classification

All Te Whānau-a-Apanui learnt at a very early age to understand the importance of the winds, especially winds that were hazardous to one's health. According to Uncle Bill (2005) men would not go out on the moana without reading the sky, first thing in the morning at dawn by observing Whakaari's plume. Wind strength can be judged by the angle and height of the plume. A high wind at Whakaari can be predicted by the way the plume is blown off the Island and along the Island. Whatever the direction, when this happens no one would go out fishing.

Further details were provided to me by Uncle Bill of the west northwest wind ('Te hauaraki uru') and south southwest wind ('Te hauauru o te tonga'), which would blow for extended periods each year. These winds were not always blustery, but the sea was disturbed enough to keep people off it. When the westerly bursts were identified this usually meant the sea would be rough and dangerous and hence members of the iwi would work extra hard, cooking and drying fish, in order to avoid starvation through the lean periods. The winds themselves were mostly constant in direction and would start at dawn and then terminate at dusk. As time passed the wind would start a little later and end a little earlier until the month would draw to a close and the 'hau-araki-uru' would disappear as a puff or zephyr. In the last week, the final wind could be seen on the sea surface and it was at this time the fishermen would return to the sea to gather

much needed fresh food. Uncle Bill provides this insight into a local wind called the hauwaho:

“As I remember when we were growing up, this wind [hau-waho - northwest-wind off the sea] would blow at that time, day one, for example, and finish at that time. Day two, it would start 20 minutes or half an hour later and finish earlier. Day three it was shorter until on day seven it just puffed up and ended. That’s how obvious it was. We don’t get the same pattern now. Recently I said is that the hau-waho now starting? And then it suddenly changed direction and I thought no that’s not the hau-waho (W. Tāwhai, personal communication, 25 May, 2005).

This understanding of the local winds highlights how embedded knowledge of weather and climate affected the lives of Te Whanau a Apanui iwi. Tēpu 8.10 identifies all the different winds that the kaumātua could remember. Further context is provided.

TEPŪ 8.10: NGĀ MOMO HAU – WIND CLASSIFICATION

NGĀ MOMO HAU WIND CLASSIFICATION	NGĀ TIKANGA MEANING	IWI TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
HAU-ANGIANGI	Breeze. Not spoken about how strong or what direction it blows but more about a romantic reference, how it caresses the cheek or touches the body, “ <i>Pā mai te hau-angiangi ki te pāpāringa.</i> ”	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-Ā-RAKI	Northerly wind (N)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-Ā-RAKI-MĀ-URU	West-north-westerly wind (WNW)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-Ā-URU	Westerly wind (W: typically hot dry winds)	Hapū: Te Whānau-a-Marū, Te Whānau-a-Pararaki Kaikōrero: Roka Paora
HAU-Ā-URU-O-TE-TONGA	South-south-westerly wind (SSW)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-KŌPEOPEO	Swirling wind (directionless)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-MARANGAI	North-easterly wind (NE: typically strong wind with rain)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-MOANA	Sea breeze, onshore wind. Locals used this breeze to get back to shore.	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua

HAU-NUI	Strong wind	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua
HAU-PATU-KAI	Strong, salt-laden sea-breeze. Also known as Hau-waho, prevailing westerly wind	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua
HAU-RĀWHITI	Easterly wind (E)	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua
HAU-TONGA	Southerly wind (S). See Ngā Tohu Taiao	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua
HAU-TŌTOKO	Dry wind	Hapū: Te Whānau-a-Tūtawake Kaikōrero: Emma Rodgers
HAU-WAHO	Wind of the sea (N: north wind). Also known as Hau-patu-kai. Prevailing wind (W: westerly). Due to the salt-laden wind, crop leaves like kūmara are burnt. Erect Pā-tūtū or Pā-koro. Starts to blow from 10am up until 5-6pm and then it stops	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai Hapū: Te Whānau-a-Maru, Te Whānau-a-Pararaki Kaikōrero: Roka Paora
HAU-WHAKAMAROKÉ-KAI	Wind that dried the crops. Also known as Hau-tōtoko. Wind causing salt-laden spray from the moana would burn the leaves of the crops. Screens of manuka called pā tūtū were erected to shelter them.	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
HAU-WHENUA	Land breeze, offshore wind (gentle, cooling)	Iwi: Te Whānau-a-Apanui Kaikōrero: All kaumātua
HŌRAPA	Blustery cirrus wind clouds that look like 'white manes' of a horse, formed by a southerly	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
HUAROA	Wind that causes rolling swells on the moana. "Ko te hau rā, kei te pupuhi mai i te wai kia haramai."	Hapū: Te Whānau-a-Tūtawake Kaikōrero: Emma Rodgers
HURIPARA	Hurricane force, severe, fierce wind	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
KOTIPUPĀRERARERA	North-north westerly wind (NNW)	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi

MARANGAI ŪPOKOKOHUA	Destructive easterly that comes down the valley and creates havoc.	Iwi: Te Whānau-a-Apanui Kaikōrero: Roka Paora
MAWAKE	South-east breeze. Mawake was also known as the tipuna who assisted in the netting of the kahawai at the Mōtū River.	Iwi: Te Whānau-a-Apanui Ahunga: Moana Waititi, 1960, p. 64
PAEROA	Wind that blows along the coastline.	Iwi: Te Whānau-a-Apanui Ahunga: Moana Waititi, 1960, p. 64
PĀWHAKARUA	Zephyr on the sea (afternoon wind). Lighter than a squall but enough to cause a slight chop. Special wind, north-east wind. When this wind blew, the home people would rush down to the moana to take their boat out to fish. The Pāwhakarua would cause the tamure (snapper) to come to the surface. Broken kuku were used as bait. In this way a whole load of fish was caught in 10 minutes.	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
PŪĀHAEHAE	Whirlwind on the sea	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
PŪĀTAKATAKA	Whirlwind on the sea	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
PŪĀWHIOWHIO	Whirlwind on the sea	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
RĀWHITIMAI-I-TE-TONGA	South-easterly wind (SE)	Hapū: Te Whānau-a-Rūtaia Kaikōrero: Wīremu Tāwhai
TUAWHARAU	Rogue wind, very violent, causes boats to twist, jerk and spin, leading to extreme damage; masts are sometimes broken	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
WHATIWHATIRAUTUTU	Squally wind, causes a chop. If this is a northwest wind waka are able to get ashore a lot faster	Hapū: Te Whānau-a-Hikarukutai Kaikōrero: Danie Poihipi
TOTAL – 28		

Ngā Momo Kapua – Cloud Classification

Te Whānau-a-Apanui elders struggled at first to identify local cloud types. It wasn't until they were asked to describe specific cloud types that brought rainfall that the kaumātua started to respond. The generic 'potae' or hat on the mountain top indicator that most iwi refer to as a sure sign of inclement weather held true for Te Whānau-a-Apanui too. It was widely used to forecast whether or not it was going to rain or be fine tomorrow, it was like a natural barometer. Many of the elders also mentioned that much of the depth of understanding regarding clouds and what different types of clouds meant to them seems to be lost. The only way they believed this knowledge could be revitalised was if a number of them along the coast committed to observing key cloud types, to ascertain whether wind or rain follows or fair weather, and noting how long it usually takes for this to occur. An interesting development occurred during the Te Whānau-a-Apanui interviews when kaumātua debated whether they should include contemporary Māori cloud names like 'Whiore Hoiho' for mares' tails to replace Pākehā cloud names. This is really interesting as it brings up other thoughts such as, does that mean that we are only dealing with pre-European terminology? And as the weather and climate change, do we adapt and change too to ensure that the mātauranga lives on, and if we do not does that mean that we cannot create new knowledge in a contemporary world? Tēpu 8.11 gives a listing of cloud classification and their description.

TEPŪ 8.11: NGĀ MOMO KAPUA – CLOUD CLASSIFICATION

NGĀ MOMO HAU WIND CLASSIFICATION	NGĀ TIKANGA MEANING	HAPŪ TAKIWĀ AHUNGA KAIKŌRERO NATION AREA SOURCE INFORMANT
HĀREWA Drifting cloud		Iwi: Te Whānau-a-Apanui Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 50-51 Waiata No.106: He waiata aroha Rārangi No.16 Hai kōrero āpiti: Synonymous with Aorewa Kōrero: Unknown
HE-AO-TE-RANGI-KA-ŪHIA Stratus clouds (St)	Overcast day	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wiremu Tāwhai

HORAPA High Cirrus Clouds (Ci)	High wind, streaky clouds across the sky. Clouds like the 'white manes' of a horse formed by a southerly coming over the Raukūmara Ranges. Blustery wind, building up to storm conditions, "he kino kei te hara mai."	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
KAPUA Generic name for cloud		Iwi: Te Whānau-a-Apanui Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 50-51 Waiata No.106: He waiata aroha Rārangi No.16 Kōrero: Unknown
PĪPIPI-O-TE-RANGI Cirrostratus (Cs)	Cloud forming a thin layer at high altitudes, could be a precursor to rain.	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
PŪREHUREHU Cirrus clouds (Ci)	White wispy clouds at high altitudes, mist lying in small detached portions	Iwi: Te Whānau-a-Apanui Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 50-51 Waiata No.106: He waiata aroha Rārangi No.16 Hai kōrero āpiti: Synonymous with Aorewa Kōrero: Unknown
PŪREI-KOHU Alto-cumulus (Ac)	Small floating clouds in patches	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
TAIPUAPUA-O-TE-RANGI Cumulus (Cu)	Thick clouds in rounded white masses	Iwi: Te Whānau-a-Apanui Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 50-51 Waiata No.106: He waiata aroha Rārangi No.16 Kōrero: Unknown
TAUMARUMARU Stratocumulus (Sc)	Low lying clouds (Overcast)	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
TĪTĪ-O-TE-RANGI	Long streaky clouds. Very high	Iwi: Te Whānau-a-Apanui

Cirrus (Ci)		Ahunga: Ngā Mōteatea II – Ngata, 2005, pp. 50-51 Waiata No.106: He waiata aroha Rārangi No.16 Hai kōrero āpiti: Synonymous with Aorewa Kōrero: Unknown
WHIORE HOIHO Cirrus uncinus (Ci unc)	‘Mares tail’. High cirrus clouds. Rain expected.	Hapū: Te Whānau-a-Apanui whānui Takiwā: Omaio Kaikōrero: Apanui Skipper Snr, Roka Paora
TOTAL - 10		

5. Ngā Tohu Taiao - Weather, Climate and Seasonal Prediction

Ngā Tohu Huarere – Weather Prediction

The creation of many weather and climate tohu or indicators after generations of observing the environment warned the coastal community of Te Whānau-a-Apanui when storms, floods, high winds, droughts or cold weather were on the way. Their observations included the lunar phases of the moon, what side the volcanic plume of Whakaari lay on, the rising and setting of the stars, the blooming patterns of certain trees and shrubs, and the age and aspect of the moon. It was within this context that Te Whānau-a-Apanui hapū knew what type of weather, climate or season to expect.

Many of the kaumātua who had been invited by Uncle Bill to come along to our hui believed that they were coming along to listen only, not to actively take part in the kōrero; however once the hui had started, he made it very clear right from the beginning that he expected all his relatives to do just that – contribute to the kōrero.

There was quite a robust kōrero regarding the ability to forecast the weather. Uncle Bill gave an interesting response after a participant stated that you were more vulnerable if none of the tohu known were not seen before going out fishing. He replied:

No, you can still go out but your ability to predict is reduced. You tend to react on the day as it dawns. Rather the prediction that John is talking about you're able to fortell and prepare long range now you've got to prepare short range. Thats the effect its having now (W. Tāwhai, personal communication 25 May 2005).

So, Uncle Bill provided a clear understanding that a prediction was made at dawn to decide whether any fishing would take place.

Sounds

One such person was Hopaea Ngatoro, who enjoyed the kōrero immensely until prompted by Uncle Bill to share any experiences that she might remember about 'predicting the weather'. It was during this time in the workshop that many of the participants were responding to the importance of 'āta whakarongo' or listening attentively to 'te taiao' to effectively interpret what was happening in the environment. This triggered a childhood memory for Hopaea when she accompanied her father and other whānau pig hunting. They gained access to the back hills by taking their horses up the Kereu River. She remembers her father choosing a spot near the river to set up camp on a starry, clear night. However during the early hours of the morning her father woke them all up and got them to move camp to higher ground. She remembers grumbling about having to get up and move, but in the morning when she looked back to the spot where they had been sleeping, it was under water. She asked her dad how did he know that it was going to flood when the night sky was clear? He responded, by saying that he heard echoing and booming sounds high up in the catchment; a clear indication to him that it was raining in the catchment area.

Over a very long period of time, Te Whānau-a-Apanui identified certain coastal rock-shelves that make a specific noise when swells strike the rock, forcing air through a hole causing a particular noise. Tahanga Kemara (2005) recounts:

Where I live its right on Lottin Point. And theres a rock like this one. Theres a certain sound of this rock. Its an indication that its going to be rough or its going to be calm. I forget now which rock it is. But one of them was Tokatā, there are two rocks. One makes the noise and that and its going to be good weather. And the other one makes the noise even when it's calm. If it makes that noise its going to be rough the next day.

Dave Demant (2005) also mentioned a similar rock at Whanarua Bay, where the locals took notice when a certain sound was heard:

"There was a cup shaped rock there and if it was going to get rough. And when I say rough I mean really rough. It would go boom, boom, boom. There used to be one at

Motunui²⁴⁹, But it doesn't do it any more. Either the dome has fallen away...the sea would go in there it would compress the air and it would blow the water out.

Senior kaumātua Danie Poihipi also acknowledged the importance of swells striking reefs, “Waves hitting the rocks (boof), papaki ngā ngaru, wave clap then boof!!! A tohu that a storm is approaching even though the weather is fine” (Poihipi, 2010)²⁵⁰. Uncle Bill also mentioned the type of sounds the moana caused as it struck the Omaio coastline at Otūwhare:

Along the beach from Omaio to Otūwhare where I live we can predict the weather by where the sound is coming along the beach...and the quality of the sound. The hollowness and the quality of the sound could be used to predict rainfall within hours. And we know when to start to take wood inside because its going to rain and we won't get anything dry...by listening to the sound [of the waves] moving along the coast. It was a science! Mōhio katoa aku koroua, anā, ērā kei te mea rā ka pakō mai rā te tai! Ehara, ko mea te mea rā, ka pakō mai rā te tai! [translation: All my elders knew that that would happen when the tide boomed over there...when the tide boomed over there] Arā those fullas have the same indicators down there. So we are talking about weather indicators we were expert at listening to the sounds of the sea... I can tell you myself I can tell you exactly where the rain sound is going to come from. If it moves over 20 yards I know its not a rain sound. And the quality the hollowness of that sound tells me its going to rain in 2 hours time. Something I learnt from my pakeke, which tells me they were scientists. They know...mā te whakarongo, arā, Arthur is nodding, so it was happening at his end of Whānau-a-Apanui too. Mā te haruru o te akau [By the booming sound along the coastline (W. Tāwhai, personal communication, 25 May 2005).

He acknowledged that there was a lot of kōrero about interpreting the sounds of the moana along the beach by the home people and that his people were expert at listening to the sounds of the sea. The specificity of this sound indicator was truly remarkable.

Volcanic Plume

Uncle Bill explained that Te Whānau-a-Apanui are blessed to have a natural barometer, an active volcano called Whakaari or White Island approximately 50 kilometres off their coastline. It is also simply known as ‘The Kūia’²⁵¹. Daily, Te Whānau-a-Apanui kaumātua would take a walk outside and face the north to ascertain what information, weather wise, the Kūia would be giving those of her people who knew what to look for. Her volcanic plume was used to determine a range of expected weather conditions. On a

²⁴⁹ Located near Awanui, where Nanny Kawa and Nanny Pita Huritū lived

²⁵⁰ Danie Poihipi was interviewed for PhD studies at Te Rūnanga o Te Whānau - Te Kaha

²⁵¹ ‘The Old Lady’, a term of endearment

clear day an optical illusion can be created causing it to seem as though the ends of the island are lifting out of the sea; it also looks a lot closer than normal. According to Uncle Bill:

The thickness of the plume, its shape, angle and the side on which the plume lies all indicate the type of rain, wind direction and storm intensity that can be expected. When the plume rises straight up then lies to the east Te Whānau-a-Apanui see that there is a high, light westerly breeze blowing and therefore safe to go out fishing. A careful watch still has to be kept just in case the weather changes. If the plume starts to break off the westerlies are strengthening – the sea will cut up – it is time to go home. If the plume bends westward the wind is swinging to the east and the sea will turn rough within hours. Time to get off the sea again. If the plume rises straight up then flattens and the end breaks off, watch out. Under these conditions no one would go out on the water. The westerlies are strengthening into gale force strength and by 1-2 hrs a violent storm will strike the Te Whānau-a-Apanui coastline hanging around for 3-4 days (W. Tāwhai, personal communication, 25 May 2005; Nga Puna Waihanga, 1993, p. 38).



Whakaahua 5: Kaiwhakaahua: Will Hine – Whakaari

To demonstrate further how effective these tohu associated with the volcanic plumes of Whakaari are, Uncle Bill recounted a kōrero involving an uncle of his who had taken him and his tuakana Koro out fishing. His uncle always kept an eye out for the `Kūia` just in case the weather changed for the worse. He noticed the volcanic plume start to break up indicating a bad storm on its way. He told the two of them to pull their lines up immediately. At that time Koro had hooked a large fish and was totally focused on pulling that fish onboard. The uncle saw what he was doing and promptly cut his fishing line. He yelled out to Koro, “You can pull that fish up, but you’ll be swimming back to

shore!” No sooner had they made it back to the beach the storm broke. Both of them knew if they were still on the moana at that moment, they would not have made it back alive; it was as simple as that. Uncle Bill learnt a valuable lesson that day that he would never forget.

Fishing

Arthur Waititi explained that his ‘Uncle Syd’ was the person who taught him most of what he knows about fishing and whaling. He was also one of the most proficient in predicting the weather:

Ētahi wā, ka kī mai kāre he pai mō te hī ika i ngā rangi e tata mai ana, nā te mea, he kohu e tere ana ki runga o Tihirau maunga, tētahi atu tohu kua kitea e ia rānei. I te mōhio a Uncle Syd ki te pānui i ngā tohu o te rangi, ngā tohu a Tāwhirimātea, te moana, ngā mea katoa. I ētahi rā, ka kī mai he pai te haere ki te hī i te atatū, engari me hoki ki uta i mua i te wā tina, nā te mea, ka huri te hau, ā, ka karekare te moana i te ahiahi. I pērā ai ki ana kōrero i ngā wā katoa tēnā ki au i taua wā. Nāna au i whakaako ki wērā momo taonga mātauranga. He rerekē ngā āhuatanga whakaako a Uncle Syd i ērā atu koroua.

Sometimes, he would say it wasn’t the right time to go out fishing in a few days time because fog was seen on top of Tihirau mountain, one of the signs he had seen. Uncle Syd knew how to understand the weather signs, the signs of Tāwhirimātea, the ocean, all those things. Some days, he would say it would be a good time to go fishing just after sunrise, but you had better return before lunch time because the wind would turn and the sea would start to chop up by the afternoon. His talk would always be like that all the time to me during that time. He taught me those types of special knowledge. Uncle Syd had a different teaching style to other elders.

Waititi (1960), states that when: “The southerly²⁵² wind blew, and it rained; then the wind blew along the coast²⁵³ and then followed a south-east sea breeze²⁵⁴. Mōtū River was in flood”. Te Whānau-a-Hikarukutai-Ngāti Horomoana knew that when they observed this phenomenon happening, they needed to start preparing for stormy conditions and to expect the Mōtū River levels to rise.

The following three tables detail some of the tohu used by Te Whānau-a-Apanui to mark, monitor and manage activities²⁵⁵ that are linked to changes in local weather and climate. Notice that some of the tohu such as clouds and wind are also located in previous tables. It shows how integrated and interconnected this body of localised knowledge is.

²⁵² Hau-tonga

²⁵³ This wind was known as a Paeroa

²⁵⁴ Mawake

²⁵⁵ Mainly food gathering activities.

TĒPU 8.12: NGĀ TOHU HUARERE – WEATHER INDICATORS

INGOA NAME	TOHU INDICATOR	WHAKATAUNGA EXPECTED OUTCOME	HAPŪ TAKIWĀ AHUNGA KAIKŌRERO NATION REGION SOURCE INFORMANT
ĀROHIROHI Mirage	The west and eastern ends of Whakaari observed lifting out of the water and the island also looks a lot closer	Wind expected from that quarter	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wiremu Tāwhai
ĀWHEO Lunar halo	Halo around the moon	Bad, windy weather ahead	Hapū: Te Whānau-a-Hikarukutai, Te Whānau-a-Kauaetangohia Kaikōrero: Danie Poihipi, Arthur Waititi
HARURUTANGA O TE PAE Booming of the ranges	Booming, roaring sound in the Kereu catchment	Rising floodwaters expected. Go to higher ground.	Hapū: Te Whānau-a-Apanui Kaikōrero: Hopaea Ngatoro
HAU TONGA Gale force southerly	Dust-like appearance to the north, on the horizon out to sea. “Kai te puehu te pae, he hau tonga kai te haere”	A violent, blustery southerly strikes the Te Whānau-a-Apanui coastline in 3-4 days	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wiremu Tāwhai
HORAPA High Cirrus Clouds	High wind, streaky clouds across the sky. Clouds like the ‘white manes’ of a horse formed by a southerly.	Blustery wind, building up to storm conditions, “he kino kei te hara mai.”	Hapū: Te Whānau-a-Hikarukutai Takiwā: Maraenui Kaikōrero: Danie Poihipi
HUKAPAPA Frost	Severe frosts	Fine weather. Frost on the land, fine weather expected. Easy to catch fish during these conditions. Once the frosts disappear, the moana is rough the next day.	Hapū: Te Whānau-a-Kauaetangohia Takiwā: Whangaparāoa Kaikōrero: John Waenga
KOHU Mist	Mist gathering near the mouth of rivers and	Southerly on its way	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare

	travelling along the beach		Kaikōrero: Dave Demant
KOHU Mist	<p>1. Mist gathering near the mouth of river and as it travels along the beach it fizzles out half way along it.</p> <p>2. Mist gathering near the mouth of river and travels along the beach and reaches Arthur's house.</p>	<p>1. The conditions of the moana are safe for fishing.</p> <p>2. The conditions of the moana are not safe for fishing.</p>	<p>Hapū: Te Whānau-a-Kauaetangohia</p> <p>Takiwā: Whangaparāoa</p> <p>Kaikōrero: Arthur Waititi</p>
KOTIPUPĀRERARERA NNW wind	North-north-west wind.	This wind is usually accompanied by rain.	<p>Hapū: Te Whānau-a-Hikarukutai</p> <p>Takiwā: Maraenui</p> <p>Kaikōrero: Danie Poihipi</p>
KURA-HAU-AWATEA Halo around sun	Halo around the sun	Rainstorm ahead	<p>Hapū: Te Whānau-a-Apanui</p> <p>Kaikōrero: Hopaea Ngātoro</p>
MANUKA Tea Tree – <i>Leptospermum scoparium</i>	Lifting of the Manuka canopy by wind off the sea.	Storm approaching.	<p>Hapū: Te Whānau-a-Hikarukutai</p> <p>Takiwā: Maraenui</p> <p>Kaikōrero: Danie Poihipi</p>
MARANGAI Torrential rainfall	Torrential rainfall in the upper catchment of Te Waiti/Pūangiāngi over 2-3 days	Flooding expected along the Papatea flood plains near Raukokore.	<p>Iwi: Te Whānau-a-Apanui</p> <p>Kaikōrero: Huhana Wright, Ripeka Martin, Tony Wattam, Noki Martin, Arama Koopu</p>
NGĀ NGARU PAPA Swell	The booming sound of breaking waves across the beach along the Omaio (Tokamaia) Bay and the particular sound created when the waves struck certain rocks during a fine day. Tokatā is another rock that makes a certain noise.	Storm approaching next day.	<p>Hapū: Te Whānau-a-Rūtaia, Te Whānau-a-Hikarukutai, Te Whānau-a-Kauaetangohia</p> <p>Takiwā: Otūwhare, Omaio, Maraenui, Whangaparāoa</p> <p>Kaikōrero: Wiremu Tāwhai, Danie Poihipi, Tahanga Kemara</p>

PĀUA Abalone – Haliotis australis	Pāua's muscular foot attached to a rock, and the shell extended upright to trap seaweed	Storm approaching	Hapū: Te Whānau-a-Hikarukutai Takiwā: Maraenui Kaikōrero: Danie Poihipi
RĀ Sun	A pale ring - halo around the sun.	Bad weather is expected soon, within 6 – 12 hours.	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
TIHIRAU Mt Tikirau	Clouds like a potae over Tihirau during a fine clear day.	Heavy rain storm approaching.	Hapū: Te Whānau-a-Kauaetangohia, Te Whānau-a-Tapuaeururangi Takiwā: Whangaparāoa Kaikōrero: Tahanga Kemara
WAKATIRI Lottin Point	Two coastal rocks (one still known called Tokatā) near Wakatiri (Lottin Point) make a noise on a fine day.	Rough weather expected the next day.	Hapū: Te Whānau-a-Kauaetangohia Takiwā: Whangaparāoa Kaikōrero: Arthur Waititi
WHAKAARI White Island	<ol style="list-style-type: none"> 1. The plume lies to the left. 2. The plume rises upwards intact across the horizon. 3. The plume rises straight up and bends to the east 4. The plume rises upwards, flattens and then breaks off. 	<ol style="list-style-type: none"> 1. Rainfall is expected. 2. Continued fine weather. 3. A high, light westerly breeze²⁵⁶ 4. Watch out! Get off the ocean. Violent storm approaching. 	Hapū: Te Whānau-a-Rūtaia Takiwā: Otūwhare, Omaio Kaikōrero: Wīremu Tāwhai
WHATIWHATI RAUTUTU North west wind - offshore breeze	A squally wind. This indicator follows the manuka lifting due to a squally off-shore breeze.	This is an indicator to fishermen that the moana will start to 'chop up' shortly. If this is a north west	Hapū: Te Whānau-a-Hikarukutai Takiwā: Maraenui Kaikōrero: Danie Poihipi

²⁵⁶ This tohu indicated to Te Whānau-a-Apanui that it was safe to go out fishing. Careful observation of the plume continued just in case of a wind change.

		wind boats are able to get to shore a lot quicker.	
TOTAL - 19			

Matapae Āhuarangi - Climate Prediction

Te Whānau-a-Apanui elders would look for a number of long-range weather indicators so that they could prepare as best they could when these environmental indicators revealed that extreme weather events would occur in the future. If the Pōhutukawa flowers prolifically from the bottom up the expected outcome is drought conditions during the summer. If flowering starts from the top first it means that a wet, cool summer is on its way. In 2007, people throughout the North Island noticed Pōhutukawa flowering from the bottom up. The summer of 2007-2008 was the worst drought in Aotearoa in 70 years²⁵⁷. Tēpu 8.13 identifies a number of climate indicators that were sourced from the wānanga at Te Wānanga o Awanuiārangi.

TĒPU 8.13: NGĀ TOHU ĀHUARANGI – CLIMATE INDICATORS

INGOA NAME	TOHU INDICATOR	WHAKATAUNGA EXPECTED OUTCOME	HAPŪ TAKIWĀ AHUNGA KAIKŌRERO NATION REGION SOURCE INFORMANT
KŪAKA Godwit	The arrival of the kūaka.	Warmer season commences.	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
MANU KĀHAWAI Tern	Manu Kāhawai nesting lower than usual at Puketapu or at Awanui.	Bountiful summer expected	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
MARAMA Moon	<ol style="list-style-type: none"> 1. In the first five nights of the lunar month, the crescent moon is lying on its back. 2. The crescent moon is standing up and down. 	<ol style="list-style-type: none"> 1. A dry month lies ahead. "Kua apowai te marama." Fine weather. 2. A wet month lies ahead. "Kua riringiwai te marama." The 	Hāpu: Te Whānau-a-Rūtaia, Te Whānau-a-Hikarukutai Kaikōrero: Wīremu Tāwhai & Danie Poihipi

²⁵⁷ The drought of 2019-2020 is even longer. It started in October and ended in June 2020. The drought tohu was seen throughout the motu.

		moon is tipping water until it stops.	
PAREĀRAU Jupiter	1. The shimmer around Pareārau is light and misty 2. Pareārau is clearly seen in the night sky.	1. Wet, cold conditions for the next month. 2. Dry month ahead.	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
PARERA Grey duck	Ducks moving their nests to higher ground.	Wetter than normal summer season ahead	Hāpu: Te Whānau-a-Hikarukutai Kaikōrero: Tapa Poihipi
PIPIWHARAUAUA Long tailed Cuckoo	The arrival of the Pipiwharaua.	Spring has arrived.	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
POANGANGA Clematis	Periodic blooming.	A warm season lies ahead with gentle breezes.	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
PŌHUTUKAWA Metrosideros excelsa	1. Flowering starts from the top branches & progresses downwards. 2. Flowering starts from the lower branches & progresses upwards.	1. Cold & wet summer will follow. 2. A long & hot (drought) summer will follow	Hāpu: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
TOTAL - 7			

Matapae Wāhanga o Te Tau - Seasonal Prediction

Seasonal indicators were an important skill that the Te Whānau-a-Apanui hapū had to master in order to take the opportunity of harvesting, fishing, netting, gardening, hunting or any other communal activity that involved the successful gathering of traditional kai. Stars, winds, fauna and flora were the usual indicators that let Te Whānau-a-Apanui know that a migration was about to start. At the beginning of this case study, the Te Whānau-a-Apanui worldview was explained. It talked about the importance of Poumātangatanga, and how he asked Rehua for one of his tamariki, the moki. The Te Whānau-a-Apanui elders also identified the star Autahi

(Canopus) as the seasonal tohu that signalled the Moki season was about to commence, so they needed to prepare themselves and their fishing gear in anticipation:

Well this is a famous star in Te Whānau-a-Apanui stories – Autahi because it ties in with the story of Poumātangatanga²⁵⁸ mai katoa...right back to Hawaiki and right back to the tamaiti taperu te ngutu. Tae atu ki Whioreore me I-waho-rā. It ties in the whole mythological tradition and history of Te Whānau-a-Apanui. It depends on Autahi (Tāwhai, 2005).

Another very important fish species to Te Whānau-a-Apanui was the kahawai. The kahawai, as previously explained, again involved Poumātangatanga. Te Whānau-a-Apanui hapū (Te Whānau-a-Hikarukutai, Te Whānau-a-Tūwahiawa, Te Whānau-a-Nuku, Te Whānau-a-Rūtaia) knew that when they saw the rarauhe starting to turn brown and the karaka berries turning a golden colour that the kahawai would return to spawn. *I ngā raumati, kia ura te karaka, kua hokihoki mai ngā kahawai ki te whakawhānau hēki. I ngā rā o mua, hukahuka te moana i te tere kahawai (Koopu personal communication).* Tēpu 8.14 summarises how Te Whānau-a-Apanui identified seasonal indicators to better understand the linkages between fauna, flora and stars with a particular taonga kai²⁵⁹.

TĒPU 8.14: NGĀ TOHU O TE TAU – SEASONAL INDICATORS

INGOA NAME	TOHU INDICATOR	WHAKATAUNGA EXPECTED OUTCOME	HAPŪ TAKIWĀ AHUNGA KAIKŌRERO NATION REGION SOURCE INFORMANT
AUTAHĪ Canopus	Autahi seen rising in the east	Signal that the Moki season is near, the moki have returned to Te Whānau-a-Apanui.	Hapū: Te Whānau-a-Kauaetangohia: Kaikōrero: Arthur Waititi
KARAKA <i>Corynocarpus laevigatus</i>	The karaka tree is ablaze in bright fruit	Kahawai returns to spawn during summer season. <i>I ngā raumati, kua ura te karaka, kua hokihoki mai ngā kahawai ki te whakawhānau mai hēki.</i> <i>I ngā rā o mua ,</i>	Hapū: Te Whānau-a-Hikarukutai: Kaikōrero: Emma Rodgers

²⁵⁸ Ruamoengarara left from Puketapu on his taniwha, Tū-tehihi, Tū-te-wawa and Tū-te-takawerangi. He returned to Hawaiki to get Pou. And it was Pou who asked the god Rēhua to give him the moki.

²⁵⁹ Customary food, such as moki, kahawai

		hukahuka te moana i te tere kahawai.	
KŌHAI <i>Sophora</i> spp	Kōhai are flowering “Ka pūāwai te kōhai, ka tere te mārearea.”	The mārearea (whitebait) are running	Hapū: Te Whānau-a-Apanui Kaikōrero: Hopaea Ngātoro
MANU KAHAWAI Tern	Manu Kahawai nesting closer to the rivers or estuaries of the Hāparapara.	Bountiful summer expected	Hapū: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
PĀWHAKARUA North-easterly	Zephyr, nor-east wind blowing	Tamure are easily caught when a pāwhakarua blows	Hapū: Te Whānau-a-Rūtaia: Kaikōrero: Wīremu Tāwhai
PŌHUTUKAWA <i>Metrosideros excelsa</i> -NZ Christmas Tree	Pōhutukawa flowering “Ka pūāwai te pōhutukawa, ka pātero te kina.”	Kina is fat – summer is here	Hapū: Te Whānau-a-Apanui Kaikōrero: Roka Paora
PŪANGA Rigel	Pūanga seen rising in the east	Signal that the Moki season is near, the moki have returned to Te Whānau-a-Apanui.	Iwi: Te Whānau-a-Apanui Kaikōrero: Huhana Wright, Ripeka Martin, Tony Wattam, Noki Martin, Arama Koopu
RARAUHE Bracken Fern	Rarauhe has turned brown	Kahawai run returns to spawn during summer season	Hapū: Te Whānau-a- Hikarukutai: Kaikōrero: Emma Rodgers
TIO Frost	Frosty morning	Sea conditions are excellent for fishing during winter	Hapū: Te Whānau-a- Kauaetangohia: Kaikōrero: John Waenga
WHĀNUI Vega	The rising of Whānui bright and low at night approximately 9.30pm seen about mid-June.	Signal that the moki is migrating and therefore the moki season.	Hapū: Te Whānau-a- Kauaetangohia: Kaikōrero: Peraro Matenga
TOTAL - 10			

6. Tirohanga Whānui - Longitudinal Observation

During the interviews Te Whānau-a-Apanui elders were asked if they had a view about global warming and climate change, and if they had noticed any significant changes in weather and climate during their lifetime. All of the participants acknowledged that localised weather and climate patterns had changed in their experience from when they were children. Their observations included reduced frosts, hotter, drier summers, heavier rains and changes in wind direction. They are finding it a lot harder to accurately predict local weather and climate indicators these days. Grace Kemara notes that, *“The trees are flowering much earlier now and they don’t tell us what they used to. This might be a result of climate change”* (Grace Kemara, personal communication, 25 May, 2005).

Frequency of frosts: One of our kuia, Roka Paora, gave an example of the changes she had noticed during her lifetime:

“When we used to go to school then there used to be ice, actual ice on the side of the road, in the puddles. Now you don’t see it anymore...I haven’t seen it for years. We picked it up and called it tio...don’t know why tio, because it was cold maybe. Now of course you grow up and you get to eighty and you suddenly realise, oh, the world must be getting warmer” (Roka Paora, personal communication, May 25, 2005).

It is a memory that she doesn’t think too often about, but admitted later was ashamed that she too had followed the cows around to stand in fresh cowpats to warm up her frozen feet. Roka triggered a memory for her whanaunga, John Waenga. He recounted his own memories during the 1950s and the 1960s referring to severe frosts and fishing:

I remember the 50s or 60s we would have frosts, severe frosts and it would go on for days and days, and weeks and weeks. As long as we know there’s a frost we know that the weather is going to be good. We’re talking about winter time and talking about a certain species of fish. Then we know that the fishing is going to be good day after day after day. But today what’s happened? The only frost that’s happened this year is the day after Anzac Day. It was only a light frost. But previous to that there’s not been a lot of frosts (Waenga, personal communication 25 May, 2005).

Dave Demant, an in-law who married Molly, also recalls severe frosts during these times. Te Whānau-a-Apanui very rarely now experiences frosts of a similar nature. The last one he remembers happened in 1980, when the Mōtū bridge was sheeted in ice. Paora, Waenga and Demant’s references to reduced numbers of frosts was supported by every other participant, including those who were not from Te Whānau-a-Apanui. Uncle Bill made this comment based on his own observations, *“There were several frosts a week*

in the old days. There are far less frosts now. Quick changes characterise the weather...and the ability to predict is reduced (Wīremu Tāwhai, personal communication 25 May, 2005). An interesting point was brought to my attention by John Waenga involving the correlation between frosty mornings and excellent fishing conditions in more recent times. Waenga (2005) warned that:

If its going to be fine today, don't get your gear ready for tomorrow you need to go out that day cause tomorrow going to be rough. As long as it going to be frosts the fishing will be good for a week two weeks like that.

This demonstrates how variable the weather has become, compared to 40-50 years ago, at a time when the climate patterns were a lot more settled.

Droughts: Many of the participants recalled the massive drought that was experienced on the coast during the summer of 1939. Most gardens and fruit trees perished in the unforgiving heat. Most of Te Whānau-a-Apanui are concerned about the lack of adequate clean, drinking water during the hot summer months. They have noticed that the summers are not only getting hotter, but are lasting longer than ever before. The concern is more acute when winter months are mild and there is a lack of rain to fill the puna (springs), “he kōpatapata noa iho²⁶⁰” (Demant, 2005). The worst droughts in recent memory happened during the summers of 1972-1973, 1997-1998, 2007-2008, and 2012-2013. All these incidents of droughts coincide with NIWA’s records. According to Demant, his spring used to start drying up about March, traditionally at the end of summer; however, since the 1980s, he has noticed that his spring dries up a lot earlier. For a period of seven years the water table in the spring didn’t rise because the heavy rains that used to fall during the months of April-May did not have enough volume of water to recharge his and other springs along the Te Whānau-a-Apanui coast.

Changes in Wind Direction: Paora (2005) commented on another observation she had made about how the prevailing wind, the hauāuru (westerly), had changed, “*It has changed. It used to start in October. Now we get it anytime, we get it right up to December.*” Uncle Bill explains that when he was a child the wind patterns along the coast of Te Whānau-a-Apanui were well known to his pakeke. During certain times of

²⁶⁰ “Only light rain fell...”

the year specific winds were expected to blow from a particular quarter. He definitely noticed some changes to some of the winds of his youth. Uncle Bill asserts that:

When I was growing up, this wind [hau-waho - northwest-wind off the sea] would blow at that time, day one, for example, and finish at that time. Day two, it would start 20 minutes or half an hour later and finish earlier. Day three it was shorter until on day seven it just puffed up and ended. That's how obvious it was. We don't get the same pattern now. Recently I said is that the hau-waho now starting? And then it suddenly changed direction and I thought no that's not the hau-waho (W. Tāwhai, personal communication, 25 May 2005).

7. Akoranga - Specialised Training

Whare Wānanga

The whare wānanga was an institution for higher learning. One whare wānanga was identified, known as Kirieke located near Raukokore (Salmond, 1975, p. 124; 1985, p. 239; Metge, 2015, p. 190). This does not mean that it is the only whare wānanga that existed in Te Whānau-a-Apanui. Different levels of training took place. Every whānau were taught the necessary skills to stay safe while undertaking any dangerous activity. Uncle Bill explained that certain individuals in the hapū, like himself, were identified quite young to spend most of their youth with knowledge holders in order to pass on their expertise to the next generation. He was brought up amongst his great grandparents who upheld the sacred responsibility of keeping the knowledge alive. They shared this responsibility with other whanaunga who lived outside of Te Whānau-a-Rūtaia. Regular wānanga was held amongst themselves in order to check each others predictions. Ground-truthing their observations was done on a regular occurrence to maximise accuracy.

Tohunga

Here is one example of a tohunga rongoā, a healer and matakite. In 1900, Tuakana Apоротanga²⁶¹ was approached by grieving parents, to find the missing bodies of 16 tamariki and two adults who lost their lives when their waka flipped crossing the Mōtū River at Maraenui. Tuakana was asked by the parents to find the bodies; he agreed. Tuakana sat beside the riverside to conduct karakia. Not long after that, rainbows

²⁶¹ Born in 1852 from Ngāti Rua

appeared from the sea and where the rainbow touched the land the bodies were found (Amoamo, 1994, pp. 3-6). Although his tribal affiliations were Ngāti Rua-Te Whakatōhea, he was also connected to Te Whānau-a-Apanui through his descent from Tautūrangi of the Nukutere waka.

8. Whakaritenga me ngā Taputapu – Application and Tools

Karakia

No karakia were identified. This does not mean that Te Whānau-a-Apanui did not know any specifically related to weatherlore. Danie Poihipi recited a karakia to demonstrate that Te Whānau-a-Apanui indeed were well versed in karakia relevant to this kaupapa (D. Poihipi, personal communication, 2010)²⁶².

Maramataka

Earlier on in my research, I found out that Uncle Bill was well versed in Te Whānau-a-Apanui maramataka. The knowledge and wisdom of maramataka and its practise was passed down to him by his elders from Te Whānau-a-Rūtaia, and other whanaunga who were holders of Maramataka knowledge. Uncle Bill's elders would say, "When the sun is touching the horizon in the evening; when the moon peers over the hills and the tide is at its fullest. That was the fullest of the full moons" (Tāwhai, 2013, p. 17). When these three components were seen at the same time, this was the beginning of the first lunar phase of the month and was known as Rākaunui or the full moon. On the morning after Mutuwhenua (15th lunar phase), Uncle Bill would get up early with his elders to anticipate the rising of the new moon. If it is not observed during a clear morning, the elders knew that this month would be one day longer than other months of the year. If there are 31 days in the month, Te Whānau-a-Apanui adds an extra day known as Takatakupūtea as required (Tāwhai, 2013, p. 16). If the new moon is seen, Takatakupūtea is held in abeyance. Following on from Mutuwhenua is Whiro, which is the rising of the new moon. Again Uncle Bill would talk about his elders getting up early in order to observe what the new moon would mean for the rest of the month. It was at this time that the elders would make their predictions after observing a crescent moon

²⁶² Danie shared a karakia that was associated with the weather

when its on its back or in an upright position for the month. If it was on its back they would say, “Kai te apo wai te marama” – “The moon is swallowing water”, meaning that the month would in the main be a dry one. But if the moon was standing upright Uncle Bill’s pakeke would say to him, “Kai te riringi wai te marama” – “The moon is pouring out water until it stops”, meaning that the month would be in the main a wet one. By understanding how to interpret what the rest of the month weather-wise they could expect, Te Whānau-a-Apanui communities could prepare accordingly based on these observations.

In Tēpu 8.15 Uncle Bill showed me the following Te Whānau-a-Apanui maramataka. For a more indepth understanding of each lunar phase refer to Uncle Bill’s book, ‘Living by the Moon’ (2013). Many iwi throughout the motu are using Uncle’s book as a template to revitalise their own understanding of Maramataka.

TĒPU 8.15: TE MARAMATAKA O TE WHĀNAU-A-APANUI

NAMA O NGĀ PŌ NIGHT	NGĀ MATA-O-TE-MARAMA LUNAR PHASE NAME	NGĀ TIKANGA MEANING
1.	Te Rākaunui	<i>The transcendent apex (Full Moon)</i>
2.	Rākaumatohi	<i>The evergreen spritual acknowledgement</i>
3.	Takirau	<i>Multitudinous but miniature</i>
4.	Ōike	<i>Obstructiveness (unproductive)</i>
5.	Korekore Tuatahi	<i>Nothingness, emptiness</i>
6.	Korekore Rawea	<i>Nature is closed in</i>
7.	Korekore Whakapiri	<i>Insubstantial (merging into the meagre fertility of Tangaroa-ā-mua)</i>
8.	Tangaroa-ā-mua	<i>Improving with the evening</i>
9.	Tangaroa-ā-roto	<i>Productiveness from within</i>
10.	Tangaroa Whakapiri	<i>Widespread peak productiveness</i>
11.	Tangaroa Whāriki Kiokio	<i>Complete fulfilled productiveness</i>
12.	Ōtāne	<i>Blessings from Tāne (god of creation)</i>
13.	Ōrongonui	<i>All-pervading positiveness, empowered by Rongo (god of growth)</i>
14.	Ōmutu	<i>Closure approaching</i>
15.	Mutuwhenua	<i>Land’s end, the termination</i>
16.	Whiro	<i>Be aware Whiro lurks, peering over the horizon (New Moon)</i>
17.	Tīrea	<i>Expanding radiance from the horizon</i>

18.	Hoata	<i>Reaching, rising upwards</i>
19.	Ōuenuku	<i>Rainbow bright</i>
20.	Okoro	<i>Intentions defined (pathways ahead clear). Take heed of nature's unpredictable moods</i>
21.	Tamatea Āio	<i>Tamatea is unsettled</i>
22.	Tamatea a Ngana	<i>Tamatea is threatening, dangerous</i>
23.	Tamatea Kai-ariki	<i>Tamatea is in a devouring mood</i>
24.	Tamatea Tuhāhā	<i>Tamatea is in a destructive mood</i>
25.	Ariroa	<i>Nature wears a disguise</i>
26.	Huna	<i>All is hidden away</i>
27.	Māwharu	<i>Everything is exposed, plentiful; take at will</i>
28.	Ōhua	<i>Time of pronouncement</i>
29.	Atua Whakahaehae	<i>The gods are in a fearsome mood</i>
30.	Turu	<i>Calm and beauty approaches</i>

HE WHAKARĀPOPOTOTANGA - SUMMARY

As previously mentioned, Te Whānau-a-Apanui is located in an isolated part of Aotearoa. All participants²⁶³ were native speakers and had spent most of their lives in Te Whānau-a-Apanui and therefore still retained an extensive understanding of localised Te Whānau-a-Apanui environmental knowledge of weather and climate. However, there were some instances where the information was deficient, such as clouds. Uncle Bill was able through a facilitative process to tease out different rain names, spiritual phenomena, but really struggled with cloud names. In spite of this, due to the efforts of Uncle Bill and many other Te Whānau-a-Apanui kaumātua, their localised environmental weatherlore still exists. The following outlines the `whenu tapu' gathered:

1. **Worldview:** Te Whānau-a-Apanui identified a definite worldview (1) based around the `moki' and the `kahawai', two taonga species that were secured by high priest Poumātangatanga
2. **Te Ao Wairua:** Te Whānau-a-Apanui kaumātua identified many forms of *tohu aituā*, and *tohu mate* (12).
3. **Ngā Maumaharatanga:** Te Whānau-a-Apanui identified (12) *whakataukī*, (8) *wāhi ingoa*, and *waiata* (3).

²⁶³ Other than Dave Demant.

4. **Ngā Whakarōpūtanga:** Te Whānau-a-Apanui identified (1) ngā moho wāhanga-o-te-tau, (18) ngā momo ua, (28) ngā momo hau, and (10) ngā momo kapua.
5. **Ngā Tohu Taiao:** Te Whānau-a-Apanui identified (19) ngā tohu huarere; (7) ngā tohu āhuarangi; and (10) ngā tohu o te tau.
6. **Tirohanga Whānui:** All participants recognised marked changes during their lifetime in the climate. The number of changes identified were (10).
7. **Akoranga:** Te Whānau-a-Apanui identified one tohunga (1), Tuakana Aporotanga and one whare wānanga, Kirieke.
8. **Ngā whakaritenga:** No karakia identified, and (1) maramataka.

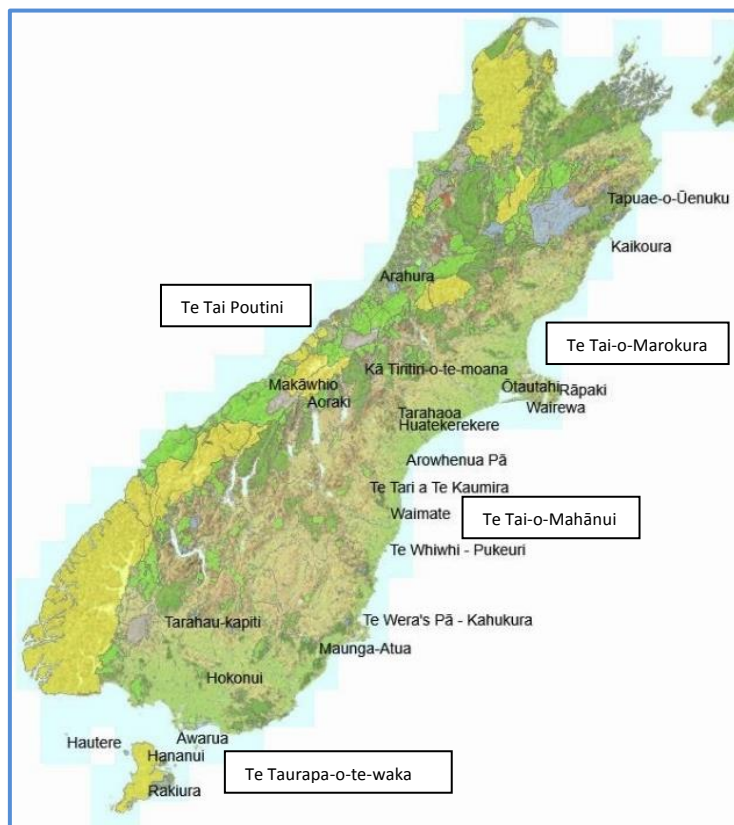
A total of **141** weather, climate and seasonal components were identified using the NWTW model to determine the health of Te Whānau-a-Apanui environmental weatherlore. The next case study takes us to Te Wai Pounamu – Ngāi Tahu iwi.

Ūpoko Tuaiwa: Wāhi Rangahau Tuatoru – Ngāi Tahu

Case Study Three: Te Wai Pounamu - Ngāi Tahu²⁶⁴

Te Wai Pounamu

*Ko lo-whakatata, ko lo-whatamai
Ko Hekeheke-i-nuku, ko Heke-i-papa
Ko Te Kore ka ahu mai ka Pō-takiwa
Nō ka Pō-takiwa ka ahu mai ka Ao Katoa
Ka puta ki waho, ki roto i tēnei ao marama
He takata hou ki te wheiao, ki te ao mārama
Tīhei mauri ora!
Uea waerea, Ka hura ka takata ā tai
Ki roto o Takaroa, ki te moana o Whakaraupō
Ka tū tonu ahau ki Pito-one, kei raro i te maru o te tihi o Kahukura
Ka ruka i kā kōhatu whakarakaraka, o Tamatea-pōkai-whenua
Ka titiro atu au, ki te tihi Kahuraki o Aoraki Mauka ariki
E tātai mai rā me tōna korowai hukahuka nui, e mariki mai rā ōna roimata wairoa
Ki roto o kā mānia o kā Pakihi-whakatekateka-o-Waitaha
Ka taki tū te uri o Tahu-pōtiki, ki te Waka-tipuna-a-Māui-tikitiki-ā-Taraka
Aua kia eke, eke panuku, eke Takaroa, tārewa tū ki te raki
Whano! Whano! Haere mai te toki!
Haumi e! Hui e! Tāiki e!²⁶⁵*



Mahere 3: Ngāi Tahu Rohe (Region)

ROHE - REGION

Case Study Three is situated throughout Te Wai-Pounamu,²⁶⁶ covering the largest region of this research. It has been organised into four main rohe. The first and southern most part of Te Wai Pounamu is known as Te Taurapa-o-te-waka or the Stern post of the canoe of Māui. Starting from southern Ōtākou on the east coast it follows the coastline

²⁶⁴ Ngāi Tahu dialect is generally spelt Kāi Tahu, however, I was advised to use Ngāi Tahu for consistency

²⁶⁵ Tikao & Beattie, 1990

²⁶⁶ Also known as Te Wai Pounemu, Te Waka-a-Māui and Te Waka-a-Aoraki

to the south across Te Ara-a-Kiwa²⁶⁷ (Fouveau St) Strait to Te Punga-o-Te-Waka-a-Māui - Rakiura (Stewart Island). The second region is located south of the Horomaka or Banks Peninsula to southern Ōtākou, along the coastline known as Te Tai-o-Mahānui. Six settlements were identified: Rāpaki, Wairewa, Arowhenua, Waimate, Puketeraki, and Ōtākou. The third region is located along the East Coast known as Te Tai-o-Marokura or the coastline from Te Parinui-o-Whiti to Ōtautahi. The key settlements along this coastline are located at Kaikoura and Kaiapoi (Tuahiwi). The fourth region is Te Tai Poutini or the West Coast. There are two Ngāi Tahu settlements along this coastline, where part of this case study was conducted. They are Makāwhio, and Arahura. The extensive coastlines of both the east and west coasts of Te Wai Pounamu are separated by Kā Puna-karikari-a-Rākaihautu, also known as Kā tiritiri-o-te-moana or the Southern Alps divide.

TE HUARERE ME TE ĀHUARANGI – LOCAL WEATHER AND CLIMATE

The whole of Te Waipounamu is one mountainous range dominated by Kā Tiritiri-o-Te-Moana, which runs the length of the Island from the south-west to the north-east. This creates two extreme climatic conditions; very high rainfall on the west coast and frequent drought conditions experienced on the flood plains of the east coast. Four seasons in one day was a common expression from Ngāi Tahu participants, denoting how variable the weather can be in Te Wai Pounamu. Summer is the best time to get out and about, but be prepared – the weather is notoriously changeable, and even the brightest summer day can end with the temperature plummeting the next day. Mountaintops often experience freezing conditions year round, and many of them have permanent snowfields and glaciers. Rainfall is affected by the Southern Alps and exposure to the westerly storm fronts (Macara, 2016, p. 16; Wilson, 2006, p. 4). The climate in Murihiku, or the Southland region has a cooler and cloudier climate with approximately 1400-1600 hours of sunshine annually (Grant, 2004, p. 4). The freezing storm fronts that blow in from Antarctica hit this region first before any other area of Aotearoa. Hence, the original iwi that settled in these areas needed not only to be knowledgeable about predicting the weather for their continued survival but also had to be hardy to survive the extreme range of temperatures.

²⁶⁷ Known also as Te Ara-o-Kewa.

PŪRĀKAU-Ā-IWI – TRIBAL HISTORY

Successive migrations were undertaken by tribal groups either forced south by more dominant iwi or lured south by the rich, abundant food resources. The principal iwi is Ngāi Tahu, who take their name from their eponymous ancestor Tahupōtiki, who descended from Paikea and Wairutu-a-tai. Tahupōtiki was forced to leave the Te Tairāwhiti area when he showed signs that he was in love with his tuakana, Porouraki's wife Hemo-ki-te-raki. Tahupōtiki returned to the north after hearing that Porouraki had died, to bring Hemo back with him to Te Waka-o-Aoraki. The other main iwi groups are Kāti Mamoe, Waitaha and Rapuwai (Tau, 2006, pp. 122-126).

MĀTAURANGA TAIAO NGĀI TAHU – NGĀI TAHU ENVIRONMENTAL KNOWLEDGE OF WEATHER AND CLIMATE

In 2011, I started my first round of semi-structured and open one-on-one interviews across Te Wai Pounamu. Unfortunately, due to lack of funding it was not until 2016 that I was able to return and complete the interviews. A total of 40 interviewees in all participated from 6-9 June, 2011 and from April 4-8 and August 29-September 3, 2016. Interviews were conducted at Maraes, kaika²⁶⁸ motels and Te Wai Pounamu House of Ngāi Tahu, Kāti Mamoe, Waitaha, Rapuwai and Hawea; and included kaumātua, fishers and cultural practitioners alike. The communities where the interviews were conducted are: Te Taurapa-o-te-waka in the deep south at Awarua, to Waihōpai, Hokonui, Karitāne, Waimate, Te Umukaha, Wairewa, Rāpaki, Ōtautahi, Kaikoura, crossing over Kā Tiritiri-o-te-moana²⁶⁹ to Arahura and finally ending at Te Tai Poutini, Hunts Beach near Makāwhio. All interviews were transcribed and complemented by secondary information sources such as *Tikao Talks: Treasure from the ancient world of the Māori* (Beattie, 1990), and *Traditional lifeways of the Southern Māori* (Beattie, 1994) to name a few. This last case study differs somewhat from the previous ones due largely in part through the successful funding of my Deep South Vision Mātauranga project, entitled: 'Forecasting weather and climate extremes'²⁷⁰. I applied to Deep South in order to complete my interviews with Ngāi Tahu kaumātua and customary practitioners. Uncle Bill used to say, "He ao te rangi ka ūhia, mā te huruhuru te manu ka rere!" – "As clouds

²⁶⁸ Ngāi Tahu dialect for Kāinga

²⁶⁹ Southern Alps

²⁷⁰ <https://www.deepsouthchallenge.co.nz/projects/forecasting-weather-and-climate-extremes>

adorn the sky, so do feathers enable a bird to fly” (Wīremu Tāwhai, personal communication, 2007). Without that pūtea, my third case study would not have been completed²⁷¹. As in Ūpoko Tuawhitu and Ūpoko Tuawaru, the Ngā Whenu Tapu e Waru framework was applied with this case study.

1. Te Aronga-ā-Ngāi Tahu - Ngāi Tahu Worldview

*Raro-timu, Raro-take
Raro-pou-iho, Raro-pou-ake
Ko Takuu, ko Takeo
Io-io-whenua, Tipu-kerekere
Tipu-anana, Kai-a-Hawaiki
Ko Matiti, Matiti-tua
Matiti-aku, Matiti-aro
Ko-teke-ehu, Te Whare-patahi
E Hui-te-rangiora, e Rongo ki waho
Matatahi mai te ara o tū manuhiri tūārangi
Kei tawhiti te kai; kai te waro te kai
Te kainga tū ko ko i tū hā (Tikao & Beattie, 1990, p. 26).*

This creation narrative of Ngāi Tahu involves two parts. The first is the creation recital of the Rarotimu whakapapa, provided above by Teone Taare Tikao, a tohuka of Ngāti Irakehu – Ngāi Tahu, Rāpaki; and the second was sourced from Associate Professor and Ngāi Tahu Historian, Te Maire Tau. Tau describes his people’s worldview as ‘mirror knowledge’ that all things were related and held together by whakapapa (Tau, 2001, pp. 136-137). He goes on to explain in more detail that the world was created after 10 stages of Te Pō (darkness), which then evolved into Te Ao (light). After these two periods followed the 10 stages of Te Kore (nothingness), and then from out of Te Kore emerged Raki (Sky father), who had a number of wives. From the numerous offspring of these unions the Ngāi Tahu universe was created. The following is a Ngāi Tahu creation chant:

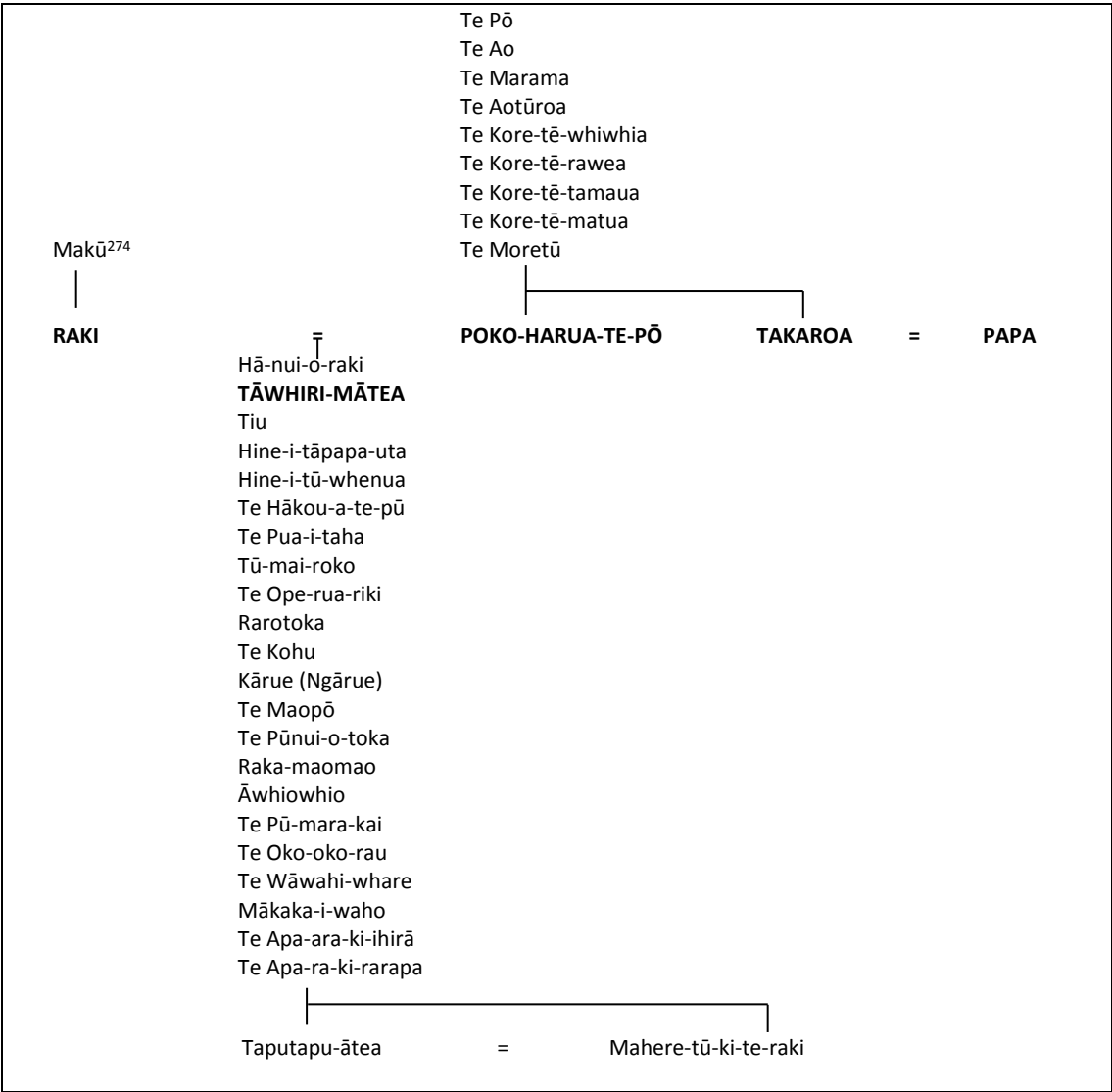
Kei a Te Pō te tīmatanga mai o te waiatanga mai o te Atua. Nā Te Pō, ko Te Ao. Nā Te Ao, ko Te Aomārama. Nā Te Aomārama, ko Te Aotūroa. Nā Te Aotūroa, ko Te Koretēwhiwhia. Nā Te Koretēwhiwhia, ko Te Koretērawea. Nā Te Koretērawea, ko Te Koretētāmaua. Nā Te Koretētāmaua, ko Te Koretēmatua. Nā Te Koretēmatua, ko Te Mākū. Nā Te Mākū, ka noho i a Mahoranuiātea, ka puta ki waho ko Raki²⁷².

²⁷¹ Other than providing information for my PhD, a number of deliverables resulted from this research: 24 video recordings online; two bilingual weather and climate posters; and a published paper in Ngāi Tahu’s Te Karaka 2018. Including a paper in He Manawa Whenua indigenous Research Conference 2017 yet to be published

²⁷²<https://www.doc.govt.nz/Documents/about-doc/role/policies-and-plans/west-coast-cms2010/westcoast-cms-complete.pdf>

All things from Te Kore (the void of nothingness), through the countless ages of Te Pō (darkness), to the first seen flicker of light - Te Ao (light), to Te Aotūroa (the World of Light, the long standing light). From Te Aotūroa, Te Mākū (moisture) emerged. The following whakapapa in Tēpu 9.1 encapsulates the Ngāi Tahu creation narrative. It displays the descent lines commencing from Te Pō down to Poko-harua-te-pō, the wife of Raki and their offspring namely a list of well known weather phenomena. The majority are wind names reinforcing the affect local winds had on the psyche of the iwi²⁷³. Raki is known to have taken Takaroa's wife, Papa. They fought, Takaroa manages to injure Raki with his spear. Despite this Raki and Papa cohabitated and had many offspring (Tikao & Beattie, 1990, pp. 23-31, Beattie, 1994, pp.368, 395-396).

TĒPU 9.1: HE WHAKAPAPA MŌ TE WAIATAKA MAI O KĀ ATUA



²⁷³ See Waitaha Winds whakapapa page 296

²⁷⁴ Ko Mahora-nui-ā-tea te whāea o Raki

2. Te Ao Wairua - Spirit World

Maunga play an important role in the spiritual and cultural beliefs of Ngāi Tahu, particularly as they are seen as the gateway to the atua (gods). Across Te Wai Pounamu there are many sacred mountains; however, none are more revered than the paramount tipuna maunga known as Aoraki (cloud piercer), the eldest child of Raki and Pokoharua-te-pō. Travelling along the west coast on a typically wet day, it is very easy to see how Ngāi Tahu whānui could be forgiven for thinking that towering mountains shrouded in mists and roiling dark clouds with fountain-like waterfalls seemingly appearing out of the sky, was the kaik of the gods like Tāwhiri-mātea, Rakamaomao, and Tūkapua. The mystique of towering, majestic mountains is firmly fixed in the hearts and minds of the Ngāi Tahu people. If lightning, known as kapo, flashed repeatedly towards a mountain, hill, or river, the locals knew it was a tohu that presaged a calamity for their leading ūpoko ariki and their hapū (Tikao & Beattie, 1990, p. 90). Another known tohu mate is the aurora australis or southern lights. When it was seen, it was said to be a sign someone prominent was going to die.

Beattie (1994), recounts an oral narrative spoken publicly by a rakatira after witnessing a gusty sleety rain, exclaiming, *“E takata nui ko mate rānei kai te mea rani ki a mate āpōpō ka roko tātau – A great man will die, we will hear the tidings by and by”* (p.197). There are a number of instances where he uses examples like these to show how spiritually connected the Māori of Te Wai Pounamu were. Here is another: *“E takata mana”*, meaning only personages of great mana and prestige could affect the elements of nature by causing the wind to howl, a chilly rain to fall, and thunder and lightning to boom (p.197).

According to oral traditions (Cowan, 1910), on the highest point of the Huriawa Peninsula at Waikouaiti – Karitāne, stood the famous pā and kaik called Pā-kātata of the Kāti Huirapa, Kāti Te Ruahikihiki of Te Wera. He was a warrior chief of dread renown. Due to a perceived slight, Te Wera’s nephew, Taoka, raised a war party against his uncle, laying seige to his pā at Huriawa. Te Wera’s Pā was unique; it was not only a pā of formidable strength, it also had a spring called Te Puna-wai-a-Te Wera, ensuring that the inhabitants would not go thirsty. An essential part of being a successful leader was

future-proofing, planning for situations like this. Te Wera always made sure that the pā was well stocked with food to last many months.

After six months had passed, Taoka organised a daring escapade to infiltrate Te Wera's pā. The mission aimed to gain access to the pā and steal the prized tribal kaitiaki called Kahukura, the rainbow god and also the tribal god of war (Cowan, 1910). The Rainbow god, Kahukura is a feature of Ngāi Tahu known throughout Te Wai Pounamu, including the Te Taihū iwi to the north within their tribal narratives. The tohuka whakātere waka would rely on Kahukura to keep on the right pathway. They would karakia to Kahukura to ensure safe passage and fine weather (Beattie, 1994, pp. 400-401). Its visible manifestation is a double arch, the upper bow being a male and the lower one a female. If thunder is heard during the daytime and you see Kahukura, the double rainbow, the smaller one is known as Rakiora. A pōua from Oraka-Aparima said, *"When you saw a double rainbow, the back one was called Rokomai and the front one was his son Kahukura. He had never heard the word āniwaniwa for rainbow. Kahukura is the name for any rainbow but when only a small portion of a bow is visible, it is known as a mutukou"* (Beattie, 1994, p. 200).

Kahukura was a well-known tohu to show that the rain had ceased, but if the bow was not fully formed, it was seen as a sign that the local people were threatened by some ill fortune in the near future. Tohuka were approached to protect them by means of appropriate karakia. Rainbows were also regarded as a sign that someone connected to some one or other was travelling abroad. The rainbow, in a sense, was also seen by Ngāi Tahu Māori as the physical manifestation of mana. When a rainbow was seen in the Murihiku rohe, Māori would know that Te Ao-matara, a tohuka of Ngāi Tūhaitara was travelling about. After a domestic incident, Te Ao-matara's wife ran away. She also saw this rainbow and knew he was pursuing her (Beattie, 1994, p. 200).

Tēpu 9.2 as in Ūpoko Tuawhītu and Ūpoko Tuawaru, I present here tohu aituā and tohu mate, collected mainly from Beattie (1994) and Tau (2008). However, not many tohu

identified and unknown why that is the case. Perhaps a number of reasons due in part to the influence of Christianity and colonisation?²⁷⁵

TĒPU 9.2: NGĀ TOHU AITUĀ ME NGĀ TOHU MATE – SIGNS OF CATASTROPHE AND DEATH

KĀ MOMO TOHU TYPE OF INDICATOR	KĀ TĪKAKA MEANING	IWI TAKIWĀ AHUKA KAIKŌRERO NATION AREA SOURCE INFORMANT
WHETŪ-O-TE-MARAMA	Kā Momo Tohu: Tohu aituā – Sign of misfortune. Whetū o te marama: This was an old practice of divining the outcome of a battle by the location of the star in relation to the crescent or horns of the moon. If the attacking star that is approaching the moon represents your side, the victory will fall to your side. But if the star is on the side of the enemy, the assault will fail.	Iwi: Ngāi Tahu, Kāti Mamoe Takiwā: Kaikoura Ahuka: Tau, 2008, p. 103 Kaikōrero: Maru-kai-tātea ²⁷⁶
TUTUMAI AO Aurora australis – Southern Lights	Kā Momo Tohu: Tohu mate – Sign of death. When the Southern Lights were seen to the south over Stewart Island, someone prominent in the community was about to die	Iwi: Ngāi Tahu, Kāti Mamoe Takiwā: Murihiku Ahuka: Beattie, 1994, p. 200 Kaikōrero: Maru-kai-tātea
KAHUKURA Partially formed rainbow	Kā Momo Tohu: Tohu aituā – Sign of misfortune.	Iwi: Ngāi Tahu, Ngāi Tūhaitara Takiwā: Murihiku Ahuka: Beattie, 1994, p. 200
AWHĀ Storm	Kā Momo Tohu: Tohu mate – Sign of death. Stormy weather. Only people of mana could influence the weather at the point of their deaths. E takata nui ko mate rānei kai te mea	Iwi: Ngāi Tahu, Kāti Mamoe Takiwā: Murihiku Ahuka: Beattie, 1994, p. 197

²⁷⁵ See Ūpoko Tuarima – Deliberate interruption of Traditional Knowledge Base, pp. 129-131.

²⁷⁶ Another version states that Te Wanikau and not Maru utters these words

	<p>rani ki a mate āpōpō ka roko tātau – <i>A great man will die, we will hear the tidings by and by.</i> If a chief died and shortly after the hau (wind), ua (rain), or whaitiri (thunder) came on, the people would say, “E takata mana”, meaning it was an expression of his mana (influence). Similarly if a high born lady’s demise was accompanied by similar manifestations the people would say, “E wahine mana.” Or if both a woman and a man had died shortly before a thunderstorm the saying would be, “E takata mana, e wahine mana rānei.”</p>	
TOTAL – 4		

3. Kā Maumaharataka - Memory Techniques

As has been shown previously with Hauraki and Te Whānau-a-Apanui, Ngāi Tahu epistemology differs quite markedly from Pākehā epistemologies in the way it creates, records and interprets mātauraka hou or new innovative knowledge. Not only is the Ngāi Tahu view based upon a completely different worldview, but it is totally reliant on a strict, disciplined regime to ensure that Ngāi Tahu mātauraka is retained for the benefit of current and future generations.

Tēpu 9.3 lists a number of whakataukī related to weather, in some cases a sign of imminent death of a rakatira, climate and the seasons that encapsulate and reflect a Ngāi Tahu perspective of the environment they live in. These whakataukī are examples of techniques Ngāi Tahu whānau, and hapū retained important information. Sourced mainly by Mandy Home (Kāti Huirapa ki Arowhenua).

TĒPU 9.3: KĀ WHAKATAUKĪ – TRIBAL PROVERBS

KĀ WHAKATAUKĪ PROVERBS	KĀ TIKANGA MEANING	IWI HAPŪ TAKIWĀ KAIKŌRERO AHUKA TRIBE SUBTRIBE AREA INFORMANT SOURCE
E takata nui ko mate rānei kai te mea rani ki a mate āpōpō ka roko tātau – <i>A great man will die, we will hear the tidings by and by.</i>	When a chief passed away after a storm that involved squally, torrential rain, howling winds, lightning and thunder, locals would say, “he takata mana”. In other words, it was his mana that caused the stormy weather. See Te Ao Wairua.	Iwi: Kāti Mamoe, Waitaha, Ngāi Tahu Takiwā: Te Taurapa-o-Te-Waka Ahuka: Beattie, 1994, p. 197
He kōpikopiko, he tōtoro anō o te irika pakake, he ua, he āwhā kei te tata mai – <i>The furling and unfurling of hanging kelp, approaching rainfall or storm.</i>	Ngāi Tahu observation. Coastal Ngāi Tahu hapū relied on the natural resources from both the land and the sea for their sustenance. They also relied heavily on biological indicators to inform them of any changes in the weather, especially bad weather. Tiny Metzger and his whānau are renowned for keeping the Murihiku – Ngāi Tahu cultural practices alive, especially the use of the bull kelp for making Poha, a receptacle for storing tītī (muttonbirds).	Iwi: Kāti Mamoe, Waitaha, Ngāi Tahu Takiwā: Te Taurapa-o-Te-Waka Kaikōrero: Graham Tiny Metzger
Hopukina kā kārara e te Pīwaiwaka i te taha o te awa, he ua, he marakai kai te haere – <i>Insects caught and eaten by Pīwaiwaka by the side</i>	When Kāti Huirapa ki Arowhenua locals noticed the Pīwaiwaka in a feeding frenzy feasting on insects that were visibly in abundance, they would utter this whakataukī.	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Homes

<i>of the river, downpour imminent.</i>		
Kai te rere te tama a Whēkoi – <i>The son of Whēkoi is falling</i>	Ngāi Tahu believed that snow was the tamaiti of the atua Whēkoi	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Ahuka: Keane, 2010, p. 36
Ka kāpuapua te taipua kei muri i te pae o Te Tari-o-Te-Kaumira, ā, ka ahu atu ki te raki hoki, ka tae mai te hukapapa – <i>When the cumulus clouds bank up at the back of the Hunter Ranges while being pushed by a northerly, snow is expected to fall shortly.</i>	Kāti Huirapa ki Arowhenua observation. Taipua are cumulo-nimbus type clouds. Mandy ²⁷⁷ also said that when these types of clouds are seen moving in an anti-clockwise direction towards Timaru and moving north towards Banks Peninsula this storm front usually brings snowfall as well.	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home
Ka kitea, ka rangona, kua tae mai te matahau, ka whakapapapounamu te moana – <i>Its seen, then heard, Matahau has arrived, the ocean is calm.</i>	Another Kāti Huirapa ki Arowhenua observation. When the northwest arch is seen to the west over the Southern Alps, it signals the foehn – nor-westerly wind and how it flattens the sea off the Te Umukaha coast. A flattened sea creates opportunities for fishermen and divers to harvest the moana while the nor-westerlies are blowing. The nor-westerlies are very turbulent winds, causing trees to fall over, and causing	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home

²⁷⁷ Mandy would also comment that another precursor to a snow dump is hot, muggy weather

	damage to houses and property. The eerie noise it creates can cause some people to go crazy and in some cases become violent.	
Ka noho te kohu i ruka i te tihi o Te Tahu-a-Te-Kaumira, kātahi ka heke iho, he ua kai te haere - <i>Fog suspended on top of the Tahu-a-Te-Kaumira (Mt Nimrod) and then descending downwards, rain imminent.</i>	On the day that Herries Beattie interviewed his informant, he foretold rain after observing this tohu and sure enough, he got absolutely drenched before he finished cycling to the railway at Waihao. H.T. Te Maire and Rawiri Te Maire were the informants.	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p. 199
Ka noho te kohu i ruka i te tihi o Te Whiwhi, he ua kai te haere - <i>Fog suspended on top of Te Whiwhi hill, rain imminent.</i>	If thick fog was seen on Te Whiwhi hill near Pukeuri, North Otago, located near the junction at SH1 and SH83 this was regarded as a sure sign of rain.	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Takiwā: Pukeuri-Waitaki Ahuka: Beattie, 1994, p. 199
Ka piko Te Ika-o-Te-Raki, he marakai kai te haere; ka noho tika Te Ika-o-Te-Raki, he rā paki kai te haere - <i>If the Milky Way has a curved aspect, bad weather is expected; if the Milky Way has a straight aspect, fine weather is expected.</i>	Kāti Huirapa ki Arowhenua weather indicator proverb.	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home

<p>Ka taki te māuru, ka hara mai te toka - When the nor'wester howls, the southerly advances.</p>	<p>A Ngāi Tahu whakataukī that describes the special character of the Nor'wester, the North-west Arch and how this front was viewed as a precursor to a freezing cold southerly. Local Māori from Ōtautahi knew when they saw this phenomenon that bad weather was on its way, with possibly a dump of snow as well.</p>	<p>Iwi: Ngāi Tahu Takiwā: Ōtautahi Kaikōrero: Mātakiwi Wakefield</p>
<p>Ka taki te poraka i te pō, he ua āpōpō - <i>If poraka whistles and croaks at night, rain tomorrow.</i></p>	<p>A Kāti Huirapa ki Arowhenua weather indicator.</p>	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home</p>
<p>Ka tangi te kārearea ki waenga o te rangi pai, ka ua āpōpō; ka tangi ki waenga o te rangi ua, ka paki āpōpō - <i>If the falcon cries on a fine day, it will rain on the next day; but if it cries on a rainy day, the next day will be fine .</i></p>	<p>The NZ Falcon is more commonly known as a sparrow hawk. This is one of a number of adages that seek to forecast weather on the basis of other natural occurrences. Other similar proverbs are as follows: Ka tangi te Kāiaia e te rangi paki, he rangi nā āpōpō²⁷⁸, “<i>If a sparrowhawk screams on a fine day, it will rain on the morrow</i>”. A Ngāi Tahu proverb: Kai te tangi mai te kārewarewa te wā o te raki pai, he ua āpōpō; kai te tangi mai te kārewarewa te wā o te raki kino, he rā pai āpōpō.</p>	<p>Iwi: Ngāi Tahu Takiwā: Te Wai Pounamu Ahuka: Brougham, 1975, p. 129; Taylor, 1855, p. 132</p>

²⁷⁸ Riley, 2013, p. 386

<p>Kai te taki te wahanui ki te toka; kai te tono atu ki te toka tō taki - <i>When the cry of the nor'wester calls to the south; it is bidding that the southerly blow too.</i></p>	<p>A Kāti Huirapa whakataukī from Arowhenua – Te Umukaha that describes the special character of the nor'wester. When the wahanui or nor'wester blows and displays an arch overhead, and a southerly has slammed into it, the locals knew that early next morning there would be a snow dump.</p>	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka: Beattie, 1994, p. 198</p>
<p>Kauaka e haere kia rite ngā whetū – <i>Don't start on a journey until the stars are right.</i></p>	<p>Herries Beattie explained that the Murihiku iwi took instruction from their atua who were responsible for different parts of the sky. Matariki (Pleiades) and Wero stars (in Canis Major) provided sailing tohu, and Autahi (Canopus), Taukurua (Sirius) and Puaka (Rigel) indicated what type of weather and season to expect.</p>	<p>Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Roberts, V. Kohikohinga 1929, p. 287; Beattie, H. Traditions and Legends 1918, p. 154 JPS Vol.27.</p>
<p>Mehemea he raki takō i kā pō o te makariri, ā, he hukarere hoki kei ruka i te tihi o Tarahaoa, ka tau mai te huka āpōpō - <i>If there are clear skies on winter nights and snow on the Tarahaoa summit, frost will settle tomorrow.</i></p>	<p>A Kāti Huirapa ki Arowhenua observation. Snow on Mt Tarahaoa (Mt Peel) during a fine clear day, a lingering frost is expected the next day, with no sun.</p>	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home</p>

<p>Mehemea ka hikohiko te kapo, i ruka i te pae, kāre i roa ka whai ko te hau i te taha o te pae e kaha kōpurapura ana</p> <p><i>- If the lightning flashes on the horizon, a wind will follow from the direction it flickered the strongest.</i></p>	<p>Ngāi Tahu proverb. The side on which lightning flashes the strongest, signals the direction of the wind to come. In the early 1900s Teone (Hōne) Taare Tīkao, a Ngāi Tahu elder, described three types of lightning. He said ūira was ordinary lightning, kohara was the zigzag flashes of lightning across the sky, and kapo was an occasional flash all around the horizon, which he believed was a sign of wind²⁷⁹. Another Ngāi Tahu elder says he also knew three types of lightning – ouria, kohara and kapo. The latter name applied to a flash here and there all around the horizon or sky and it is a tohu or sign, of wind. Tāwhiri-mātea sends it, and lightning generally. Hinenuiotetoka holds Te Pū-o-Te-Hau (The Power of the wind) and Tāwhiri-mātea (or Tāwhiriwhiri as he is also know) is the fan the wind goddesses use to disperse the winds over the world.</p>	<p>Iwi: Ngāi Tahu</p> <p>Hapū: Kāti Wheke</p> <p>Takiwā: Rāpaki</p> <p>Ahuka: Tikao & Beattie, 1990, pp. 46-47</p>
<p>Nā taku kupu ki a koe, ko te whetū o te marama, kaua e waiho ki te māhaka</p>	<p>There are two meanings to this proverbial saying. The first is in reference to an old practice of divining the</p>	<p>Iwi: Ngāi Tahu</p> <p>Takiwā: Kaikoura</p> <p>Ahuka: Tau, 2008, pp. 98-103</p>

²⁷⁹ <http://www.teara.govt.nz/en/tawhirimatea-the-weather/page-5>

<p>harakeke, kei kaika e te ua, whitikia ai te rā pakapaka, takihia te hau ka motu, ekari waiho i te māhaka tī, māhaka whītau kia whitikia i te rā, kia takihia te hau, kia uaina te ua e kore e motu - <i>I will say to you, the star is sitting above the moon. Do not leave your prey to a trap made of undressed flax to be rained on, beaten by the sun, blown by the wind and then broken. Instead, you should make a trap from dressed flax or cabbage tree leaves so that the sun can bear down, the wind can blow, the rain can beat down, and it will never snap.</i></p>	<p>outcome of a battle by the location of a star in relation to a crescent moon. Secondly, it compares to strategic planning to the proper preparation of harakeke in order to produce cordage that will last in all kinds of weather.</p>	
<p>Nā Puaka rāua ko Taku-rua a Aotahi, ka puta a Aotahi i te marakai, ka karakia te iwi, ka taki, ka aroha, ka mihi, he whetū tapu a Aotahi. Ka rikoriko mai te mata o Puaka i te hauraro, he tohu tau</p>	<p>He tino whetū tohu a Puaka ana puta mai i tētahi (in July), ā, ki te mea, ka āhua panapana ngā hīhī o Puaka ki te tonga, he tohu tau kino i taua tau, ā, ki te mea ka rikoriko ana hīhī ki te hauraro, he tohu tau pai, <i>“The rising of Puaka was seen as an important sign in July and if</i></p>	<p>Iwi: Ngāi Tahu Ahuka: White, 1887, pp. 52-53[Pākehā] / 45[Māori]</p>

<p>pai. Ka rikoriko mai i te tonga, he tau kino, he ua, he hau, he ua āpōpō - Puaka was her father and Takurua was her mother; when [Aotahi] she appears in the east, the people repeat incantations, weep and welcome her, Aotahi is a sacred star. When Puaka twinkles and flashes its rays towards the north, it is an omen of a fine year. When it twinkles and flashes its rays towards the south, it is an omen of a bad year of rain and wind, rain will also follow tomorrow.</p>	<p><i>the rays of Puaka flashed towards the south, a bad season was expected that year, and, if it flashed to the north it was deemed a bountiful year. Matariki rises two to three weeks before Puaka²⁸⁰. Puaka is a star that flickers and changes colour. Ngākapa, a group of stars in a straight line, shows the near approach of Puaka as they rise two or three days earlier. Tuahiwi Māori state that Puaka was Rigel, and it appeared as a morning star in the beginning of May.</i></p>	
<p>Rere tata mai kā Wairua-takata ki te rama, ka ua āpōpō - Moths attracted to a torch, rain tomorrow.</p>	<p>A Kāti Huirapa ki Arowhenua weather indicator.</p>	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home</p>
<p>Takoto kau a Marama ki ruka i tōna tūara, he ua ka whai ake i kā rā e toru - Marama lying on its back, rain will</p>	<p>Another Kāti Huirapa ki Arowhenua weather indicator. Like many other iwi throughout Aotearoa, Kāti Huirapa viewed the moon on its back as a cup holding a lot of water and therefore a sign</p>	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home</p>

²⁸⁰ Beattie, 2009, p. 363

<i>follow after three days.</i>	of bad weather ahead. If the moon came in half and half (half on its end and half on its side) it was a sign of mixed weather.	
Tau mai te tōmairaki i te awatea, he raki wera rawa te rā e whai atu²⁸¹ - Early morning mist (haze), a very hot day follows.	A Kāti Huirapa ki Arowhenua observation. When locals at Arowhenua saw this phenomenon in the morning from about 5am, they knew it was going to be a scorcher that day. Sometimes the haze would be about tree height.	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home
TOTAL: 18		

In Tēpu 9.4 it lists a number of place names that are relevant to this research. As explained in the last two case studies, place names help to retain memory over very specific parts of the whenua. These place names are located throughout Te Wai Pounamu. Sources are mainly from Herries Beattie.

TEPŪ 9.4: KĀ WĀHI IKOA – PLACE NAMES

IKOA MĀORI MĀORI NAME	IKOA PĀKEHĀ ME KĀ TIKANGA PĀKEHĀ NAME AND MEANING	IWI TAKIWĀ KAIKŌRERO AHUKA TRIBE REGION INFORMANT SOURCE
AORAKI	Mt Cook. 'Cloud piercer', 'Cloud in the sky'. Tallest mountain in Aotearoa. 3754m high.	Iwi: Ngāi Tahu Takiwā: Kā Tiritiri-o-te-moana-Southern Alps Ahuka: Reed, 2002, p. 97
AWATEA	'Broad daylight', 'Middle of the day'.	Iwi: Ngāi Tahu Takiwā: Otakou, Otago Ahuka: Reed, 2002, p. 30
AWEAWE	'Floating in the air'. Tells of when local Māori liked to travel in the early morning time when mist was prevalent 'me haere tātou mā te	Iwi: Ngāi Tahu Takiwā: By the Aparima river, between Riverton and New River Heads. Ahuka: Beattie, 2001, p. 56.

²⁸¹ Mandy Home, personal communication, 2012

	aweawe' (let us go by way of the mist). 'Misty way'.	
HAKAPOUA	'Bay of Showers'. A lake near Pōteriteri	Iwi: Ngāi Tahu Takiwā: Murihiku, Southland Ahuka: Beattie, 1994
HAUMATE	'Death wind'. When West-North-West blows waka capsize. Also known as Wawa-waiāu.	Iwi: Ngāi Tahu Takiwā: Rakiura-Stewart Island Ahuka: Beattie, 1994
HAUMURI	'North wind'.	Iwi: Ngāi Tahu Takiwā: Kaikoura Ahuka: Reed, 2002, p. 191
HAUNUI	'Strong wind'. Near Clutha River	Iwi: Ngāi Tahu Takiwā: Otakou, Otago Ahuka: www.topo.co.nz
HAUROKO	'Sound of the wind', 'Windy lake'. Near Kaherekoau Mountain range	Iwi: Ngāi Tahu Takiwā: Murihiku, Southland Ahuka: Reed, 2002, p. 192
HAU-TE-KAPAKAPA	'The Flapping of the wind'. The assembly ground of Te Wera's pā on Huriawa Peninsula.	Iwi: Kāi Te Ruahikihiki, Kāti Huirapa, Ngāi Tahu Takiwā: Waikouaiti – Karitāne Ahuka: Cowan, 1910
HAUTERE	Solander Island - Place of swift wind. The recorded mean wind speed on this island is 34km/hr and by this criterion it is acknowledged as the windiest place in Aotearoa. In other words, be vigilant, this area can be very dangerous.	Iwi: Kāti Mamoe, Waitaha, Murihiku, Ngāi Tahu. Takiwā: Te Ara-a-Kewa, Foveaux Strait Kaikōrero: Graham 'Tiny' Metzger Ahuka: Ashwell, 1998
KOHURAU	Kurow - Many mists. A place where mists form often. A local legend talks about a chief who escapes up the Kohurau hills, and by chanting a karakia he conjures up a fog to hide from his pursuers.	Iwi: Ngāi Tahu Takiwā: Otakou, Otago Ahuka: Reed 2002, p. 259.
KOHUTĀPAPA	'Mist lying flat'.	Iwi: Ngāi Tahu Ahuka: Vangioni, 1970, p. 108.

MAUKARARA	‘Noisy mountain’. Where wind creates strange rolling sounds as if the range were grumbling.	Iwi: Ngāi Tahu Takiwā: Otakou, Otago Ahuka: Beattie, 1944
OHAU	‘Place of winds’. May have been named after a man named Hau, supposedly a bold, rocky formidable point. ‘Windy point’.	Iwi: Kāti Kurī – Ngāi Tahu Takiwā: Kaikoura Ahuka: Elvy, 1949, p. 53
OREHEKE	Maori regarded it as ‘uncanny’ ground and avoided crossing over it. Translated as bad weather and heke – slipping down or boggy place. ‘The place of the sloping swamp or slipping bog’.	Iwi: Ngāi Tahu Takiwā: Located in the Clutha area. Ahuka: Beattie, 2001, p. 33.
ORI	‘Bad weather’, ‘gale’.	Iwi: Ngāi Tahu Takiwā: A place by Lake Wanaka by the river Haast. Ahuka: Roberts, 1999, p. 4
PŌTERETERE	‘Dripping wet’.	Iwi: Ngāi Tahu Takiwā: Murihiku, Southland Ahuka: Beattie, 1944
PŪREHUREHU	‘Misty cloud’. A small headland called Pūrehurehu Point. High mist congregates on the hill above the Headland.	Iwi: Ngāi Tahu Takiwā: Otakou Ahuka: NZ Topo Map
RĀKAHURI	The Sky turned around. The Pākehā name is Ashley River	Iwi: Ngāi Tahu Takiwā: Kā Pākihi Whakatekateka o Waitaha Ahuka: Beattie, 1995
RANGIORA	“Good weather”; “The Calm after a storm” or “Place of peace after a time of trouble”. It recalls the agreement between Te Hautapu-nui-o-tū (Ngāi Tahu) and Rakihiia (Kāti Mamoe).	Iwi: Ngāi Tahu Takiwā: Kā Pākihi Whakatekateka o Waitaha Ahuka: Taylor, 1950, p. 29; Beattie, 1995
RANGIRIRI	‘Stormy skies’, small island or rock just north of Te Ruahine.	Iwi: Ngāi Tahu Takiwā: Akaroa Peninsula Ahuka: Vangioni, 1950, p. 5.

RIPORIPO	‘Whirlpool’; reference is made to disturbed water caused by outgoing tide from Bluff harbour and its effect can be felt and seen throughout Te Ara-a-Kiwa (Foveaux Strait). Local Māori recognised this as an indicator that the conditions out in the strait would be too dangerous.	Iwi: Ngāi Tahu, Kāti Mamoe, Waitaha, Murihiku Takiwā: Te Taurapa-o-te-waka Bluff Harbour Ahuka: Ashwell, 1998, p. 2.
TAMIAU	‘Pressed down by the wind’.	Iwi: Ngāi Tahu Takiwā: Tamihau Island, Murihiku Ahuka: Ashwell, 1998, p. 14
TARAHU-KAPITI	West Dome Mountain - The Valley of the windy peak. This is the site where Tū-te-makohu, the Kāti Mamoe chief fled from the Ngāi Tahu war party after killing Kaweriri, the famous Ngāi Tahu warrior chief in single combat. Tū-te-makohu uttered a karakia causing fog to envelop him, disappearing into the mists. He warned his pursuers to turn back.	Iwi: Ngāi Tahu Takiwā: Location is near Mossburn and the Oreti River. Kaikōrero: Dean Whaanga Ahuka: Reed, 2002, p. 573.
TE ARA-POKIPOKI	‘The mood of the eddy wind’ which is the proper name for Awarua - Bluff.	Iwi: Kāti Mamoe, Waitaha, Murihiku, Ngāi Tahu Takiwā: Te Taurapa-o-te-waka Ahuka: Roberts, 1999, p. 3
TE OREREHU	‘Misty coast’ a general name for the lofty shore.	Iwi: Ngāi Tahu Ahuka: Beattie, 2001, p. 12.
TE PĀ-NUI-O-HAU	‘Home of the wind’ or ‘a large pa belonging to a chief called Hau’. Meaning ‘the great chief, home of the spirit of the wind. Translated to mean strong southerly through the pillar like boulders on the apex. Hau was a navigator (Beattie refers to Te Hau as a Ngai Tahu chief). Highest point on Onawe peninsula	Iwi: Ngāi Tahu Takiwā: Location is also known as Mt Gibraltar, located at the head of the Akaroa harbour by Onawe. Ahuka: Anderson, 1927, p. 140; Vangioni et al, 1970, p. 7.
TŪHAU	‘The standing wind’.	Iwi: Ngāi Tahu

		Takiwā: A place between the town of Waimate and Kelcy Bush. Ahunga: Beattie, 1945b, p. 15.
TUHIRAKI	Mt Bossu - Shining or glowing sky.	Iwi: Ngāi Tahu Takiwā: Banks Peninsula Ahunga: Reed, 2002, p. 53.
WHAITIRIPAKU	‘Claps of resounding thunder’	Iwi: Ngāi Tahu Takiwā: A name of an old settlement in the vicinity of Blue Skin Bay. Ahuka: Beattie, 2001, p. 15.
WHAITIRIPAPA	‘Crashing thunder’. Known as the North rough ridge close to Wairua-po Range, Otirehu plains, Upper Taieri and Maniototo plains.	Iwi: Ngāi Tahu Takiwā: Maniototo Ahuka: Beattie, 2001, p. 36.
WHAKAAO	Cloudy harbour, small sandy beach where canoes were hauled ashore on the coast at the back of Greenhills.	Iwi: Kāti Mamoe, Waitaha, Murihiku, Ngāi Tahu. Takiwā: Te Taurapa-o-te-waka Bluff Harbour Greenshills Ahuka: Ashwell, 1998, p. 4
TOTAL: 29		

4. Kā Whakarōpūtanga - Nomenclature and Classification

Kā Momo Ua o Ngāi Tahu

Tēpu 9.5 identifies a list of rain names along with a description. These names are mainly sourced from literature, namely Beattie (1994), and Watkin (n.d.). Questions from interviews did not reveal any rain names.

TĒPU 9.5: KĀ MOMO UA – RAIN CLASSIFICATION

I KOA MĀORI MĀORI NAME	I KOA PĀKEHĀ ME KĀ ĀHUATANGA PĀKEHĀ NAME AND ITS CHARACTERISTICS	IWI HAPŪ TAKIWĀ AHUKA KAIKŌRERO TRIBE SUBTRIBE AREA SOURCE INFORMANT
AWHĀ	Tempest, severe storm, roaring of the wind	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Ahuka: Beatties, 1994, p. 198; Watkins, (n.d), p. 4
ĀNAU	Rain	Iwi: Ngāi Tahu

		Ahuka: Wakareo
HAUKŪ	Dew	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 5
HUKA	Snow	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 5
KOLOITI	Small drop	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 43
KOTITI	Drizzling rain. Kai te kotiti te awhā	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Ahuka: Beatties, 1994, p. 198
MAREHO ²⁸²	Small rain	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 43
MATARIKI	Small rain	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 5
PAIA	Easterly wind. If it blew for more than a week, rain would follow.	Iwi: Ngāi Tahu Hapū: Ngāi Tūahuriri Takiwā: Ōtautahi Ahuka: Beatties, 1994, pp. 359-360
PAKURA	A strong northwest or southwest wind accompanied by rain	Iwi: Ngāi Tahu Hapū: Kāti Moki Takiwā: Taumutu-Waihora Ahuka: Beatties, 1994, p. 336
PŪNEHUNEHU	Misty rainfall.	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Ahuka: Beatties, 1994, p. 198
PUPUTOU	Great rain	
TARU-WHAKARU	Damp, cloudy weather	Ahuka: Ministry for Culture and Heritage, 2010, p.33.
TOKA	South-west. Stormiest conditions bringing heavy rainfall, and gusts until it blows out. The south-west wind is known as toka when blowing ordinarily but when blowing a gale from this quarter it is known as 'Puitaha'.	Iwi: Ngāi Tahu Takiwā: Waitaki, Otepoti, Moeraki, Tuahiwi, Rāpaki, Te Umukaha, Waikouaiti. Ahuka: Beatties, 1994, pp. 198, 359; Henry James Fletcher: <i>J.P.S.</i> 36:137; 59:70 Genealogy; 64:189; 65:9, 169; 66:343; 67:66; 77:231. <i>A.H.M.</i> 6:256, 258. <i>M.B.</i> 3:73.
TŪPATA	Heavy drops	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 43

²⁸² Maneho?

UA	Generic name for rain	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Beatties, 1994, p. 197
WAIKOHU	Small rain	Iwi: Ngāi Tahu Ahuka: Watkins, (n.d), p. 43
TOTAL – 17		

Kā momo hau o Ngāi Tahu

Nā te Pō, ko te Ao
Nā te Ao, ko te Aomarama
Nā Raki, ka noho i a Pokoharuatēpō
Ka puta ko Hānuīāraki me kā hau katoa
From the night, came the day
From the day, came the world of light
Raki coupled with Pokoharuatēpō
And Hānuīāraki came forth, then all the winds

Ngāi Tahu iwi had an intimate understanding about localised winds. Ruahine, Khyla Russell, had this to say about Ngāi Tahu creation narratives in the Canterbury landscape:

Raki's first wife, Pōkoharua o Te Pō was the source of all winds, incantations and tapu. Thus the origins of the natural world commenced with the wind or hau-the breath of life. To Māori, "hau" is the "vitality of man" and the vital essence of the land." From Raki's union with Pōkoharua o Te Pō came Uru Te Maha, a name that literally means "The Source of the Westerly Winds." From this source came Tawhirimatea and eventually Te Mauru, who is known by many Kai Tahu as the North West wind (Russell, 2001, p. 167).

One of the most dominant winds in Te Wai Pounamu, especially in the Canterbury region, is Te Māuru e taki nei²⁸³. It is also known as Te Hau Kai Takata or the wind that devours humankind, due to the detrimental effect that this wind had on local Māori communities, in many instances causing loss of life (O'Reagan and Russell personal communication 2016).

The consensus response from the participants stated that the nor'west and the sou'west winds brought the most extreme weather, but easterlies blew a bone chilling wind that caused havoc with those who suffered from asthma. The north-west arch²⁸⁴ narrative was spoken about at length. Those who still understood this unique feature to Te Wai

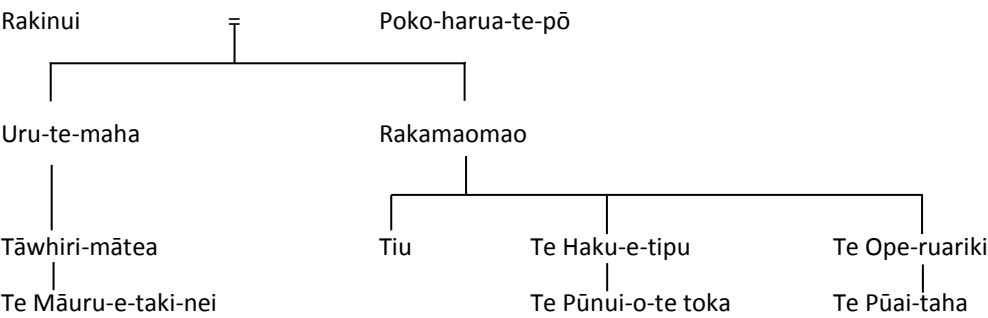
²⁸³ Nor'west wind

²⁸⁴ Ngāi Tahu names are as follows: Te Māuru, wahanui, matahau,

Pounamu, explained that when the north-west arch was seen above Kā tiritiri-o-te-moana²⁸⁵, the height of the arch determined the intensity of a southerly expected the next day, usually associated with snowfall. The blustery nor’wester that causes havoc with airline pilots as they make their approach to land, is also responsible for causing people to become depressed, irritable and lacking energy.

Tau (2005) provided this Waitaha whakapapa that shows the inter-relationship between Waitaha and the prevailing winds that were prominent over Ngā Pakihi Whakatekateka a Waitaha or the Canterbury Plains. It also showed that they had a whakapapa connection to these winds. The Waitaha understood the uniqueness of the wind patterns by creating this whakapapa.

Waitaha Winds ²⁸⁶:



Many Ngāi Tahu interviewees described the impact of Te Māuru e taki nei, after blowing for a number of days, saying that some people would get a ‘little bit crazy’ (Home, 2016). The roaring sound of the wind would cause people to get quite irritable, although on some others it would have no effect at all. Local knowledge states that Te Māuru e taki nei blew from the direction of Mt Maungatere²⁸⁷, located to the north of Ōtautahi.

In Tēpu 9.6 is a list of wind names identified from all parts of Te Wai Pounamu. Both Māori and Pākehā name are given with a description, including what part of the country it is from.

²⁸⁵ Southern Alps

²⁸⁶ Tau, 2005, p. 5

²⁸⁷ Mt Grey

TEPŪ 9.6: KĀ MOMO HAU – WIND CLASSIFICATION

IKOA MĀORI MĀORI NAME	IKOA PĀKEHĀ ME KĀ ĀHUATAKA PĀKEHĀ NAME AND ITS CHARACTERISTICS	IWI HAPŪ TAKIWĀ AHUKA KAIKŌRERO TRIBE SUBTRIBE AREA SOURCE INFORMANT
APŪ-HAU	Squall, gust	Iwi: Ngāi Tahu Ahuka: Ancient History of the Maori - Vol II: White, 1887, p. 60 [Māori]
APŪ-MARANGAI	Easterly gale	Iwi: Ngāi Tahu Ahuka: Ancient History of the Maori - Vol I: White, 1887, p. 92 [Māori], 105 [Pākehā]
AUTEHI	South-east wind	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Beattie, 1994, p.197
FAKARUA	North-east wind	Hapū: Kāti Huirapa ki Puketeraki Takiwā: Waikouaiti Ahuka: Rev. J. Watkin & Beatties, 1994
HAKOUATIPU	Southern gale - starting as a breeze then intensifying into a gale.	Ahuka: Ancient History of the Maori – Vol I; White, 1887, pp. 24, 28. See Puaitaha
HAUĀURU	North-west wind - rough, boisterous winds Westerly	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Beattie, 1994 Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p.197
HAU-MATUA	Northerly wind - a wind coming from between the north-east & north-west directions	Takiwā: Ōtautahi Ahuka: Beattie, 1990, p.47
HAU-RARO	Northerly wind North wind	Ahuka: Ngata, H. M., & Ngata, W. (1993). <i>English-Maori Dictionary</i> . Learning Media - Ngata Dictionary. Hai Tauira: Kai te kaha pupuhi a te hauraro - There is a strong northerly blowing. Ahuka: Moorfield, 2005 Hai tauira: Ka rikoriko mai te mata o Puaka i te hauraro, he tohu tau pai - <i>Rigel twinkles in the north, a sign of a good year.</i>
HAU-TAMATĀNE	West wind	Ahuka: Wakareo.

HAU-TĀNE	Strong, gale force	Ahuka: Beattie, 1994, p.359; Te Whare Hiko Rongo Kōrerotanga Māori Dictionary.
HAU-TE-KAPAKAPA	Whirling winds	Ahuka: Beattie, 1954, p.134
HAU-TURU-NUKU	Sea breeze - this sea breeze rises on the 15 th night of the moon	Ahuka: Ancient History of the Maori - Vol II: White, 1887, p. 11
HAU-TŪWHENUA	Inland wind - is a breath of wind from inland and as you get up in the morning you will feel it. It comes like a draught of cold air but is soon gone.	Ahuka: Beattie, 1994, p.199
HAU-WAHINE	Soft breeze	Ahuka: Beattie, 1994, p.359
HAU-WHENUA	Land breeze - Te hau ka pupuhi mai i te tuawhenua.	<p>Takiwā: Ōtautahi</p> <p>Ahuka: New Zealand Māori Language Commission, 2008, p.95</p> <p>Hai tauira:</p> <ol style="list-style-type: none"> 1. He hau whakamaroke kai te hauwhenua i Ngā-Pākihi-Whakatekateka-a-Waitaha. 2. He hau māriri ka āta pupuhi mai i te tuawhenua. 3. Me kore ake te hauwhenua i āhua hauhau ai ngā kāinga o te mānia. 4. Rite tonu ngā kupu e whai ake nei – Pararaki, tāwhenua
HINE-HAUONE	Controls the easterly and the northerly winds	Ahuka: Beattie, 1990, p.10
HINE-I-TĀPAPA-UTA, HINE-TĀPAPA-UTA	<p>West winds - when this breeze rises boisterous winds from other directions and rough seas are calmed</p> <p>West winds</p>	<p>Ahuka: Ancient History of the Maori – Vol I: White, 1887, pp. 24-28</p> <p>Ahuka: JPS: Vol 26, No.3. Traditions and Legends – Collected from the Natives of Murihiku (Southland, New Zealand); Beatties, 1917, p.108</p>
HINE-I-TŪ-WHENUA, HINE-TŪ-WHENUA	West winds - when this breeze rises boisterous winds from other directions and rough seas are calmed	Ahuka: Ancient History of the Maori – Vol I: White, 1887-1890, pp. 24-28

	West winds	Ahuka: JPS: Vol 26, No.3. Traditions and Legends – Collected from the Natives of Murihiku (Southland, New Zealand). Beatties: 1917, p.108
HINE-RORIKI	Northerly Winds	Ahuka: Beattie, 1990, p.10
HINE-ROTIA	Westerly Winds	Ahuka: Beattie, 1990, p.10
HUKAHUKA-TE-RAKI	A bellowing wind	Ahuka: Ancient History of the Maori – Vol 1: White, 1887, p.19
KAIHAUTAKATA	Nor-westerly - This wind “knocks everybody around”. Taare mentioned that when he was on the boats if anyone noticed a nor-west wind they would immediately turn for home. The wind would inevitably swing around and start blowing from the south. The Kaihautangata or norwester was a notorious wind for causing many waka to capsize. It was difficult to get back into port when it was blowing from this quarter.	Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Takiwā: Murihiku, Te Taurapa-o-Te-Waka Kaikōrero: Hana Morgan, Taare Bradshaw, Dean Whaanga, Tā Tipene O’Reagan
KOIO	South-east wind - coldish winds	Takiwā: Otākou ki te tonga Ahuka: Beattie, 1994, p.199
MARAKAI	Easterly wind	Ahuka: Beatties, 1994, p. 359
MARA-KAI-A-TINAKU	Destructive wind	Ahuka: Ancient History of the Maori – Vol III: White, 1887, p. 49 [Pākehā], 29[Māori]. See Te Ope-rua-riki, Pūnui, Maroro-uri and Maroro-tea.
MARANGAI	East wind - when this wind blew it was usually followed by a violent storm.	Ahuka: Wakareo. Hai whakamārama: Storm bad weather. Hai tauira: He tau huka, he pua, he iri, he marangai. Applied to a wind from the stormy quarter. Nōhea koia koe, nō te uru, nō te raki? Kao.” Nō te marangai? Kao (T. 17). North, north wind. E whā ngā tatau o taua whare, kotahi kei te rawhiti, kotahi kei te pū o te tonga,

	East, North-north, storm - gale force winds, heavy, driving rain – rainstorms and heavy surf	<p>kotahi kei te māuru, kotahi kei te marangai (W.W. 17).</p> <p>Ahuka: Beattie, 1990, p.111</p>
MĀURU	<p>North-east wind - a hot wind</p> <p>West wind - warm wind</p> <p>Nor'wester wind - when a strong nor'wester blew, either wet or dry, the people would beat the swamps and drive the pakura to fly against the wind; after half an hour they got tired and dropped to be caught.</p> <p>Strong nor'wester - rough, boisterous winds</p> <p>North-west, west wind - cold wind</p> <p>Nor-wester</p> <p>Norwester</p>	<p>Iwi: Ngāi Tahu</p> <p>Takiwā: Lower Waitaki Plains, Otepoti</p> <p>Ahuka: Beattie, 1994</p> <p>Hapū: Ngāi Tūahuriri</p> <p>Takiwā: Tuahiwi</p> <p>Ahuka: Beattie, 1994</p> <p>Iwi: Ngāi Tahu</p> <p>Takiwā: Ōtautahi</p> <p>Ahuka: Beattie, 1994, p.360</p> <p>Hapū: Kāti Huirapa ki Puketeraki, Kāti Wheke</p> <p>Takiwā: Waikouaiti, Rapaki</p> <p>Ahuka: Beattie, 1990, p.134</p> <p>Hapū: Kāti Huirapa ki Arowhenua</p> <p>Takiwā: Te Umukaha</p> <p>Ahuka: Beattie, 1994, p.359</p> <p>Hai kōrero āpiti: Also known as Potiki tāne, see Tā. Rev J. Watkin.</p> <p>Ahuka: Beattie, 1994, p.197</p> <p>Ahuka: Beattie, 1994, p.197</p>
MUAHUBOKU	Eastward wind	<p>Hapū: Kāti Huirapa ki Puketeraki</p> <p>Takiwā: Waikouaiti, Karitāne</p> <p>Ahuka: Beattie, 1994, p.198</p>
ORI	North-west, north-east wind - bad	Iwi: Ngāi Tahu

	weather, wind from a bad quarter.	Ahuka: Wakareo Hai kōrero āpiti: South- east according to locality.
PAIA	Easterly wind - if it kept blowing for a week it would be followed by rain.	Hapū: Kāti Wheke Takiwā: Rāpaki Ahuka: Beattie, 1994, pp.359-360
PĀOA	Strong east- nor-easter - a strong wind coming out of this quarter.	Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1990, p.47; Beatties, 1994, p.360 Hai kōrero āpiti: A weak east nor-easter is called a Whakarua
PARERA	Nor'wester	Iwi: Waitaha, Ngāi Tahu Takiwā: Ōtautahi Ahuka: Moorfield, 2005 Hai Tauira: He hau rongonui te parera o Waitaha, pērā anō hoki te hau tonga, ka kawē i ngā naku mai i Te Tiri o Te Moana (Te Ara 2012) - <i>Canterbury's nor'wester is a well known wind, as is the southerly, which blasts up from Antarctica.</i>
PARETAO	East-south-east - Light winds South-east wind of variable character South-east	Iwi: Ngāi Tahu Takiwā: Otākou ki te tonga Ahuka: Beattie, 1994 Hapū: Kāti Wheke Takiwā: Rapaki Ahuka: Ngāi Tahu Tribal Dictionary. Ahuka: Beattie, 1994
PARORO-TEA	White storm, white skud	Ahuka: Vol 3: White, 1887, p. 49 [Pākehā], 29[Māori]. See Te Ope-rua-riki, Pūnui and Mara-kai-a-tinaku. Maori Religion and Mythology, Shortland, 1882, p. 13
PARORO-URI	Dark storm	Ahuka: Vol 3: White, 1887, p. 49 [Pākehā], 29[Māori]. See Te Ope-rua-riki, Pūnui and Mara-kai-a-tinaku. Maori Religion and Mythology, Shortland, 1882, p. 13

POTIKI-A- RAKAMAOMAO	North and South - group of winds that blew from the north and south.	Ahuka: Keane, 2012, p. 5. 'Tāwhiri-mātea – the weather – Wind and storms', Te Ara – the Encyclopedia of New Zealand. Hai kōrero āpiti: Within this group Te Pūnui o Te Toka was the southerly & Rakamaomao's child known as Tiu was the northern wind.
POTIKITĀNE	Sou-wester wind - Potikitāne is a boiterous rough wind	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Beattie, 1994, p.197
POTIKIWAHINE	Nor-wester wind - a boiterous rough wind	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Beattie, 1994, p.197
PŪAITAHA	South-west gale force winds. Violent gale - when a 'toka' or a south west wind increases in strength to a gale it is called a pūaitaha; an exceptionally freezing cold gale. See Te Ope-ruariki	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p.197
PUĀWANGA	South-west wind - He hau ka pupuhi mai i te tonga-mā-uru.	Ahuka: New Zealand. Māori Language Commission, 2008, p.693 Hai tauira: Me kore ake te puāwanga i kawea ai ngā para ki rāwāhi. Rite tonu ki te kupu tonga.
PŪNUI	Destructive wind	Ahuka: Vol 3: White, 1887, p. 49 [Pākehā], 29[Māori]. See Te Ope-rua-riki, Mara-kai-a-Tinaku, Maroro-uri and Maroro-tea.
PŪ-TĀ-TAKI	South-south-east - associated with dirty, rainy weather. South-south-east wind	Ahuka: Beattie, 1954, p.32 Iwi: Ngāi Tahu Takiwā: Murihiku, Rakiura Ahuka: Henry James Fletcher: <i>J.P.S.</i> 65:169
PŪWAIWHAKARUA	North-west wind - when a red-parrot fish is caught, considered a sign that a north-west wind will blow.	Iwi: Ngāi Tahu Takiwā: Murihiku, Rakiura Ahuka: Andersen, 1907, p. 256 Hai kōrero āpiti: This north-west wind named after the red-parrot fish.

RĀFITI	Eastward wind	Hapū: Kāti Huirapa ki Puketeraki Takiwā: Waikouaiti Ahuka: Beattie, 1994, p.198
RĀWAHO	East-north-east - strong wind from seaward	Iwi: Ngāi Tahu Takiwā: Otākou ki te tonga Ahuka: Beattie, 1994, p.199
TĀ	<p>Westerly</p> <p>North-west wind - rough, boisterous winds</p> <p>South-west, southerly - hard, dry wind</p> <p>West wind</p> <p>Westerly</p>	<p>Iwi: Ngāi Tahu Takiwā: Tuahiwi Ahuka: Beattie, 1994, p. 359</p> <p>Iwi: Ngāi Tahu Takiwā: Lower Waitaki Plains Otepoti Ahuka: Beattie, 1994</p> <p>Iwi: Ngāi Tahu Takiwā: Waikouaiti, Moeraki, Otākou ki te tonga Ahuka: Beattie, 1994, pp.199, 359 Hai kōrero āpiti: Known also as Potiki tāne or chilly, cold winds. On the west coast at Arahuru south-west wind brings fine weather but north-west wind always brings rain. See Māuru. Rev J.Watkin.</p> <p>Iwi: Kāti Mamoe, Ngāi Tahu Takiwā: Murihiku, Rakiura Ahuka: Henry James Fletcher: <i>J.P.S.</i> 65:169</p> <p>Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p. 197</p>
TAI-HAUĀURU	West wind	Ahuka: Beattie, 1994, p. 198
TAI-RĀWHITI	East wind	Ahuka: Beattie, 1994, p. 197
TAI-TOKA	South wind	Ahuka: Beattie, 1994, p.197
TAI-TOKERAU	North wind	Ahuka: Beattie, 1994, p.197
TAUTEHI	South-east wind	Ahuka: Beattie, 1994, p. 359; Beattie, 1990, p.47
TĀWERA	Westerly, north-westerly wind -	Iwi: Ngāi Tahu

	<p>coming from the direction of Mt Tāwera (Oxford) near Rakahore, Rakahuri (Ashley) River.</p> <p>Northerly wind - strong, northerly wind</p>	<p>Hapū: Ngāi Tūahuriri</p> <p>Takiwā: Tuahiwi</p> <p>Ahuka: Beattie, 1994, p. 360</p> <p>Iwi: Ngāi Tahu</p> <p>Takiwā: Otākou ki te tonga</p> <p>Ahuka: Beattie, 1994, p. 199</p>
TE HAU-A-ROKOMAI	Storm, Tempest - offshore gale force winds	Ahuka: JPS: Vol 26, No.2; Traditions and Legends – Beatties, 1917, p. 82.
TE MĀURU E TAKI NEI	Nor'wester – forerunner of the North west arch. Most dominant wind in this rohe. Also known as Te Hau Kai Takata or The Wind that devours Humankind.	<p>Iwi: Ngāi Tahu</p> <p>Takiwā: Ōtautahi</p> <p>Kaikōrero: Khyla Russell</p>
TE OPE-RUARIKI	South-west wind - if it increases in strength to a gale, it is called a pūaitaha; an exceptionally freezing cold gale.	<p>Iwi: Ngāi Tahu</p> <p>Ahuka: Ancient History of the Maori Vol 3. White, 1887, p.12 [Maori]; Beattie, 1994, p.197.</p>
TE PŪNUI-O-TE-TOKA	Southerly wind	<p>Ahuka: Keane, 2012, p. 5; 2010, p.34.</p> <p>Hai kōrero āpiti: Within this group Te Pūnui o Te Toka was the southerly & Rakamaomao's child known as Tiu was the northern wind.</p>
TE PŪNUI-O-TONGA	Destructive wind	Ahuka: Vol 3; White, 1887, p. 51 [Pākehā], 31[Māori]. See Te Ope-rua-riki, Mara-kai-a-Tinaku, Maroro-uri and Maroro-tea.
TE PŪ-O-TE-HAU	<p>The power of the wind</p> <p>The Origin or beginning of the Southerly Winds</p>	<p>Ahuka: Beattie, 1990, p.10.</p> <p>Ahuka: Beattie, 1990, p.10.</p>
TOKA	<p>Southerly direction - one of the stormiest winds bringing rain. Variable wind</p> <p>South-west wind - this south-west wind is known as toka when</p>	<p>Iwi: Ngāi Tahu</p> <p>Takiwā: Lower Waitaki Plains, Otepoti, Moeraki, Southern Canterbury, Banks Peninsula.</p> <p>Ahuka: Beattie, 1994, pp.197-199, 361.</p> <p>Hapū: Ngāi Tūahuriri, Kāti Wheke, Kāti Huirapa ki Arowhenua</p>

	<p>blowing ordinarily but when blowing a gale from this quarter it is known as 'Puaitaha'.</p> <p>South-east wind</p> <p>South-west wind</p>	<p>Takiwā: Tuahiwi, Rapaki, Te Umukaha Ahuka: Beattie, 1994, pp. 197, 359.</p> <p>Hapū: Kāti Huirapa ki Puketeraki Takiwā: Waikouaiti Ahuka: Beattie, 1994, p. 199.</p> <p>Iwi: Ngāi Tahu Takiwā: Murihiku, Rakiura Ahuka: Henry James Fletcher: <i>J.P.S.</i> 36:137; 59:70 Genealogy; 64:189; 65:9, 169; 66:343; 67:66; 77:231. <i>A.H.M.</i> 6:256, 258. <i>M.B.</i> 3:73.</p>
TOKA-MĀ-URU	Sou-westerly wind - when it starts to blow it builds and builds and then brings torrential rain from that quarter. Sou-westers bring the most extreme weather.	<p>Iwi: Waitaha, Kāti Mamoe, Ngāi Tahu Takiwā: Te Taurapa-o-te-waka Kaikōrero: Hana Morgan, Taare Bradshaw</p>
TŪWHENUA	Land breeze - this breeze was exceptionally cold when it came off the mountains and along the Waitaki valley. When it blew Otautahi ki te toka was much colder than Murihiku. A disagreeable wind. Land breeze that blows in the morning.	<p>Iwi: Ngāi Tahu Takiwā: Waitaki Valley Ahuka: Beattie, 1994, p. 200. Hai kōrero āpiti: Any breeze that came off a river valley was known as a tūwhenua.</p>
URUAO	Tornado	Ahuka: Beatties, 1954, p. 32.
WAHANUI	Nor-wester	<p>Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1994, p. 198. Hai kōrero āpiti: Also known to come from north-north-east. Famous north-west wind that blows across the Canterbury Plains sometimes creating wind shear. Warm, turbulent wind. When the nor-wester finishes blowing, a southerly follows. Hai tauira: Kai te taki te wahanui ki te toka, kai te tono atu ki te toka tō taki - <i>The cry of</i></p>

	<p>North-north-east wind - this was a strong wind.</p> <p>North-north-westerly - this was a strong wind.</p> <p>Nor-wester</p>	<p><i>the nor-wester bidding the southerly to blow too.</i> See Māuru as well.</p> <p>Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1994, p. 359</p> <p>Ahuka: Beattie, 1990, p. 47.</p> <p>Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p. 197.</p>
WAIHOLA	<p>South-easterly</p> <p>Easterly</p>	<p>Iwi: Ngāi Tahu Takiwā: Ōtautahi, Moeraki, Kaiapoi Ahuka: Beattie, 1994, p. 197-198.</p> <p>Iwi: Ngāi Tahu Takiwā: Ōtākou Ahuka: Beattie, 1994, p. 197.</p> <p>Hai kōrero āpiti: Known as Potiki wahine or fine winds. The people say that when the Waihola & other easterly winds blew they were 'nice, gentle winds', mild sometimes, coldish.</p>
WAIHORA	<p>Southerly - wind direction coming from Lake Waihora (Ellesmere)</p> <p>Sou-easter - inclement weather wet and cold associated with this wind that swirled around for three days.</p>	<p>Hapū: Ngāi Tūahuriri Takiwā: Tuahiwi Ahuka: Beattie, 1994, p. 360.</p> <p>Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home</p>
WAIORA	East wind	<p>Hapū: Kāti Huirapa ki Puketeraki Takiwā: Waikouaiti Ahuka: Rev J. Watkin. Beattie, 1994, p. 199.</p>
WAWA [WĀWĀ?]	Westerly, land breeze, northerly - a Kaiapoi elder mentioned that the northerly wind was known as wawa.	<p>Hapū: Ngāi Tūahuriri Takiwā: Tuahiwi Ahuka: Beattie, 1994, p. 197.</p>

	Easterly	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p. 197.
WHAKARUA	North-east, easterly wind - strong and boisterous	Hapū: Kāti Wheke Takiwā: Rapaki, Moeraki, Otakou ki te tonga Ahuka: Beattie, 1994, pp.197, 199, 359. Hai kōrero āpiti: Ngāti Wheke elder states that if this 'whakarua' blows for a week, rain follows.
	East-north-east wind - sometimes whakarua was a wet or dry wind	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Ahuka: Beattie, 1994, p. 199.
	East wind	Iwi: Ngāi Tahu Takiwā: Murihiku, Rakiura Ahuka: Henry James Fletcher: <i>J.P.S.</i> 23:78; 25:111; 53:211; 65:169; 108:270. <i>W.W.</i> 2:147, 157.
	Weak east-nor'easter	Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1990, p. 47.
TOTAL – 67		

An interesting kōrero was shared concerning evidence that was presented during Ngāi Tahu settlement hearings. When Kāti Mahaki kaumātua from Te Tai Poutini were asked if there were any other way pounamu was transported to the south and to the east coast other than across the Southern Alps, the response was by waka and during winter. Their tipuna used to the opportunity of the weather window to travel south by waka transporting the pounamu when the easterlies blew over the Southern Alps causing the ocean to be calm inshore. As long as the waka stayed close to shore they would experience calm waters. However, it would be choppy further out to the west where the easterlies struck the moana.

In Tēpu 9.7 a list of cloud types are displayed along with its Māori and Pākehā names. The cloud names are sourced from a variety of places namely from Ngāi Tahu Tribal Dictionary²⁸⁸, Te Reo Tupu, White (1887). Moorfied (2005), Beattie (1994), Keane (2010) and two interviewees.

TEPŪ 9.7: KĀ MOMO KAPUA – CLOUD CLASSIFICATION

IKOA MĀORI MĀORI NAME	IKOA PĀKEHĀ ME KĀ ĀHUATAKA PĀKEHĀ NAME AND ITS CHARACTERISTICS	IWI HAPŪ TAKIWĀ AHUKA KAIKŌRERO TRIBE SUBTRIBE AREA SOURCE INFORMANT
AO	Common name for Cloud	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home
IORAKI Cirrus (Ci)	Cirrus cloud – Mare’s tail. Very high wispy clouds	Iwi: Ngāi Tahu Hapū: Ngāi Tūahuriri Kaikōrero: Joseph Hullens
PAIAO	Cloud	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: The Ancient History of the Maori, Vol 1. White, 1887, p. 140.
PAIAO-MĀ	A light, fleecy cloud	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Kai Tahu Tribal Dictionary.
PAIAO-MĀKU	Dark cloud – associated with light rain	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Kai Tahu Tribal Dictionary.
PAIAO-WHERO	Red cloud	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Kai Tahu Tribal Dictionary.
PUKEAO Cumulonimbus (Cb)	Heavy clouds - Masses of thick, heavy clouds. Cumulonimbus clouds. When these clouds are seen an intense storm is imminent	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Te Reo Tupu: rd – 191020/194048.
TAHERE Alto cumulus Lenticularis (Ac L)	Cloud lying on a mountain – associated with snow	Ahuka: Te Reo Tupu: rd – 44565/194048. Hai tauira: Tērā te hukarere e tāhere i Koinaki (S.ii, 40). Te ao ka tāhere ki Timaru rā ia (S.ii, 70).

²⁸⁸ Kāi Tahu Tribal Dictionary

TAIPUA Cumulonimbus (Cb)	Very dark, billowing, intimidating cloud, bunched together in rounded masses above mountains. Turbulent at cloud level. Violent storm imminent.	Iwi: Ngāi Tahu Ahuka: Moorfield, J. C. (2005). <i>Te Aka: Māori-English, English-Māori Dictionary and Index</i> . Longman. Hai tauira: I tētahi pō ka titiro ia ki te pō tū i waho i Te Omanga e tāruru ana, ki Te Ika o te Rangi me Ngā Pātari, ki te tae pūkahu tātaiore e taipua ana i ngā maunga (JPS, 1911, p. 17) - <i>One night he looked at the clouds beyond Te Omanga, resting close and compact, at the Milky Way and the Magellan Clouds, at the misty clouds settling in masses on the mountains.</i>
TIHORE	Cloudless sky Fine day	Iwi: Ngāi Tahu Ahuka: Te Reo Tupu: Kāi Tahu Dictionary. Iwi: Ngāi Tahu Ahuka: Williams Dictionary, p.416. E tihore ana te pō, he hukapapa – kua tihore te rangi.
TIPUKEREKERE Stratocumulus (Sc)	Stratocumulus clouds - thick, dark clouds. Usually produces no rain, but if it does it is only light. Usually seen before a storm front or after one.	Iwi: Ngāi Tahu Takiwa: Otautahi Ahuka: Beattie, 1994, p. 395.
WHAKATARITARI-UA Nimbostratus (Ns)	Dark clouds that lead to continuous rainfall	Iwi: Ngāi Tahu Ahuka: Keane, 2010, pp.32-33.
TOTAL - 12		

5. Kā Tohu Taiao - Weather, Climate and Seasonal Prediction

The ancestors of Ngāi Tahu Māori who lived across the varied land and waterscapes of Te Wai Pounamu developed an extensive knowledge of local weather and climate. This understanding was based on careful observation of daily, monthly, and seasonal conditions; as well as deeper recognition about natural linkages [whakapapa] in the environment, which can reveal much about imminent and forthcoming weather and climate conditions. Such knowledge was critical for minimising the potential for harm in a sometimes harsh and unforgiving environment.

Mandy Home, former NIWA Māori Development Manager, was one of my key interviewees. Mandy's iwi affiliation is primarily from Kāi Tahu, Kāti Huirapa ki Arowhenua – Te Umukaha, situated between Tīmaru and Hakatere (Ashburton). She has extensive whakapapa throughout Te Waka-o-Aoraki and Murihiku through her Kāti Mamoe fighting chief, Tūtemākohu, and Wētere Te Kāhu to name a few. Mandy's mother had taught her all she needed to know about how to predict inclement or extreme weather. It was not until I interviewed her that she realised how much she still retained, all thanks to her mother, who always told her and her siblings to, *“take heed of what the environment is saying”*, and *“Learn its language”* (Home, 2011). Being brought up in Arowhenua – Te Umukaha, Mandy has an intimate local knowledge of the natural environment. Arowhenua is surrounded by Te Tari-o-Te-Kaumira (Hunters Hills) to the south, the Kā Puna-karikari-o-Rakaihautū (Southern Alps) to the west and beside Tarahaoa and Huatekerekere directly due north is Kā Pākihi-whakatekateka-o-Waitaha (Canterbury Plains). Historically her tīpuna dwelt on the east coast at Wai-a-te-rua-iti Pā²⁸⁹, and surrounding kāika between the Opihi, Orari and Rakitata river mouths where rich food resources abounded.

A local pūrākau warns younger members of the tribe by telling about their tīpuna, Te Kaumira, who while travelling with an entourage, got caught in a snow storm in the ranges after misreading the weather signs. Te Kaumira wanted to find shelter and wait the snow storm out but the rest of his party wanted to press on by descending to the flats below. They implored Te Kaumira to follow them but he refused saying that he would hopefully catch up with them later. Reluctantly they departed. Te Kaumira found a slightly sheltered overhang and made himself comfortable for the cold night ahead. A week later Te Kaumira's people returned to the spot where they had parted ways. Not far from there they found his frozen body in a sleeping position under an overhang. The moral or the message to the younger generation of Arowhenua was to make sure that you pay attention to your environment for your continued survival because you might not get a second chance, just like Te Kaumira. From that time onward this range of hills

²⁸⁹ Wai-te-rua-iti refers to the prolific growth of tī from which kāuru is prepared, a sugary taoka kai that Kāti Huirapa were famous

was known as Te Tahu/Tara-o-Te Kaumira, loosely translated as ‘The folly of Te Kaumira’.

While the indicators are of most use in their respective localities, many of them are shared by hapū and iwi in other locations. Often more than one indicator is used to forecast for the day, month, or season ahead.

In the not so distant past, weather, climate and seasonal indicators were widely used by Ngāi Tahu whānui to forecast and predict changes in weather and climate. Traditional harvesting areas, known as wakawaka²⁹⁰ or mahika kai²⁹¹, demanded strict observance of local weather conditions (gale force winds, tidal currents, clouds-cumulus-nimbus, lenticular, cirrus, snowfall) to ensure a safe and successful outcome.

Snowfall on mountain ranges meant that in the future the rivers would rise, flooding the plains below, so takata mahika kai²⁹² had to be extremely mindful crossing braided rivers. They kept a look out for the river turning a dirty colour, a dead giveaway that the river was about to rise very quickly.

The wild west coast – Te Tai Poutini – is the wettest location in Aotearoa. On average 11,000+ millimetres of rain can fall annually making it the fourth wettest place in the world (Macara, 2016). Paul Wilson, and his sisters, Jan and Helen (Kāti Mahaki) know intimately how wet it can really get in Te Tai Poutini. Located near Mākawhio, these three siblings grew up knowing how to survive in this often challenging environment. They were taught at a very young age to always look out for the signs that warn of extreme weather on its way. Paul Wilson (2016) describes four triggers that he was shown to pay attention to:

1. Dark, thick cloud banks building up along the Southern Alps
2. Roaring sound of the surf to the north
3. The tidal current running from north to south

²⁹⁰ Apportionment of a natural resource between whānau, hapū or iwi.

²⁹¹ Customary food gathering place

²⁹² Cultural harvester

4. Tūpoupou (Hectors dolphins) seen to be abnormally active around the boat

He said that the dolphins acted as if they were trying to drive them off the moana and back to shore where it was safe. One easy way of finding out whether the tidal current had changed was observing the buoys. If they started moving south from a northerly direction Paul knew it was a sign that they needed to be vigilant.

Skilled and experienced elders were responsible for training the younger generation how to survive in the wild, by knowing how to recognise known potential hazards, such as the two destructive winds; the nor'westers and the sou'westers. If you made a mistake the result could be fatal. Paying attention to the sky, being able to predict what the weather is going to do needs to be taken seriously to avoid fatalities. The individuals that provided the most detail were cultural harvesters known as 'Takata mahika kai'. These individuals not only had an intimate knowledge of seasonal harvesting practices such as mutton-birding, eeling, white baiting, fishing, but also spent a lot of time outside. You needed to always focus on what was happening in the coastal, estuarine, freshwater, forest or alpine environment, especially the influence lunar phases had on daily weather conditions and on the behaviour of taoka kai.

Ngāi Tahu's ability to predict the weather also included observing the heavens at night, especially on nights when they could clearly see particular stars of significance, such as Autahi:




Autahi, shining there above us, is a weatherwise star, a foreteller of the winds and storms. Sometimes he twinkles more brightly on one side than the other. You pakehas cannot see that, of course, but our ancestors did, and so can I to-night. When he twinkles or winks very sharply and clearly on one side, and the other side is dimmer, then it is going to blow hard from the side on which the star is flashing brightest. When I see Autahi winking sharply and brightly on the south side, as he frequently does, then I know that a strong southerly wind, often a gale, is coming. This is a sign that never fails...I leave astronomers to comment on my sharp-eyed Maori mentor's scrap of star wisdom...It was the same learned man of Ngai-Tahu tribe who gave me this item of local lore about Puanga (Rigel), or as it is called in the southern dialect Puaka: "We call the group of stars Orion's Belt 'Nga Tira a Puaka.' In the beginning of June these stars are eagerly watched for. When Puaka rises out of the ocean it throws out unmistakable flashes. If these flashes are towards the north, it will be a year of plenty on land and in the sea. If they seem to flash towards the south, then it will be a lean year, and food will be scarcer than usual. This, in the tradition of our





people, has always been an unfailing omen (tohu) of conditions in the new year (Cowan, 1930, pp. 89-90).






All three iwi from Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu, used everything from their environment in order to make sense, minimise any potential hazards and simply to stay alive. To do this well they needed to know all facets of environmental indicators – tohu – to keep ‘ahead of the game’.

In Tēpu 9.8 is a list of Ngāi Tahu weather tohu, the indicator seen, the nature of the tohu, along with the expected outcome. Participants identified 28 weather tohu, with the balance sourced from literature. A feature of these tables that were not seen with the previous case studies, images of the tohu are included.

TĒPU 9.8: KĀ TOHU HUARERE – WEATHER INDICATORS






IKOA NAME	TOHU INDICATOR	WHAKATAUKA EXPECTED OUTCOME	IWI ROHE AHUKA KĀIKŌRERO TRIBE REGION SOURCE INFORMANT
ĀROHIROHI Haze 	Haze viewed early morning (5am) about tree height	Extremely hot conditions that day	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Homes Ahuka whakaahua: Apanui Skipper, 2016
ATA-A-MĀURU 	A light colour in the sky to the west, inland above Canterbury Plains viewed from Banks Peninsula.	Fine weather expected	Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1994, p. 361 Ahuka whakaahua: Martin Koitmae – Wikimedia Commons
ATA-Ā-WAI 	A pale bluish light out to sea due south	Forewarning of bad, southerly weather	Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie, 1994, p. 361 Ahuka whakaahua: Martin Koitmae – Wikimedia Commons
AUTAHĪ	Autahi twinkles very clearly on one side and the other side is dimmer	1. Blows hardest on the side which the star is flashing brightest	Ahuka: Anderson, 1907, p. 89; Cowan, 1930, pp. 88-89. Ahuka whakaahua: NASA – Wikimedia Commons





<p>Canopus</p> 		<p>2. If it is flashing on the southern side, a gale is imminent</p>	
<p>AWA Braided River</p> 	<p>1. Rivers that come off the Southern Alps change from a clear colour to a whitish-brown known as 'waiarahi'</p> <p>2. The colouration of the river changes to a brownish-orange, known as 'waitohi'.</p>	<p>1. Alert sounded</p> <p>2. Danger imminent – travelling party moved to sheltered, higher ground to await the storm to abate.</p>	<p>Iwi: Ngāi Tahu Hapū: Ngāi Tūahuriri Takiwā: Ōtautahi Kaikōrero: Joseph Hullens Ahuka whakaahua: Greg O'Beirne – Wikimedia Commons</p>
<p>HĀKOAKOA Fluttering Shearwater - <i>Puffinus griseus</i></p> 	<p>The Hākoakoa makes a great noise while in its burrows</p>	<p>A storm is approaching. No man hearing this will venture out to sea on his waka.</p>	<p>Iwi: Kāi Tahu Kaikōrero: Raumumu Ahuka: Andersen, 1907, p. 343 Ahuka whakaahua: Duncan Flickr – Wikimedia Commons</p>
<p>IORAKI Mares' Tails - Cirrus clouds</p> 	<p>High clouds similar to horses' tails observed above the Canterbury Plains</p>	<p>A shift in weather conditions from fine to bad, due in 2-3 days</p>	<p>Iwi: Ngāi Tahu Hapū: Ngāi Tūahuriri Takiwā: Ōtautahi Kaikōrero: Joseph Hullens Ahuka whakaahua: Alan Blacklock - NIWA</p>
<p>KĀ HIHI KANAPA O TE RĀ</p>	<p>The sun rising above Hikuika (Mt Sinclair) preceded by:</p>	<p>1. Rain imminent 2. Fine weather expected</p>	<p>Ahuka: Beattie, 1994, p. 361 Ahuka whakaahua: Christian Blake – Metservice.com</p>

<p>Sun's rays</p> 	<ol style="list-style-type: none"> 1. Red streaks around the peak 2. Grey streaks around the peak 		
<p>KĀ KARU NUI</p> <p>Ocean swells</p> 	<p>Enormous ocean swells reach the west coast</p>	<p>12 hours later the first of the Parera or Norwest winds arrive. Within 24 – 36 hours the Parera turns into a gale, releasing approximately 3m of rainfall on the west coast.</p>	<p>Iwi: Ngāi Tahu</p> <p>Hapū: Kāti Waewae, Kāti Mahaki</p> <p>Takiwā: Te Tai Poutini</p> <p>Kaikōrero: Paul Wilson, Helen Rasmussen</p> <p>Ahuka whakaahua: Dave Allen - NIWA</p>
<p>KĀ KURAKURA-O-HINE-NUI-TE-PŌ²⁹³</p> <p>Aurora australis</p> 	<p>Aurora australis (southern lights) is clearly seen at night to the south.</p>	<p>Improving, fine weather next day approximately 6-8 hours.</p>	<p>Iwi: Ngāi Tahu</p> <p>Hapū: Kāi Tūahuriri, Kāti Huirapa</p> <p>Takiwā: Te Taurapa o te waka</p> <p>Kaikōrero: Hana Morgan</p> <p>Ahuka whakaahua: Andrew Oliver – Flickr.com</p>
<p>KAPO</p> <p>Sheet Lightning</p> 	<p>Lightning flashing on the horizon</p>	<p>The side on which the flashes are the strongest signals the direction of the wind to come</p>	<p>Ahuka: Beattie, 1994, p. 360</p> <p>Ahuka whakaahua: Griffinstorm – Wikimedia Commons</p>
<p>KARAE²⁹⁴</p> <p>Rain bird - <i>Procellaria westlandica</i></p> 	<p>Very distinctive harsh screeching cry</p>	<p>Rain imminent in 3-4 hours</p>	<p>Iwi: Ngāi Tahu</p> <p>Hapū: Kāti Mahaki</p> <p>Takiwā: Makāwhio, Te Tai Poutini</p> <p>Kaikōrero: Paul Wilson</p> <p>Ahuka: Beattie, 1994, p. 167</p> <p>Ahuka whakaahua: Mark Jobling – Wikimedia Commons</p>






²⁹³ Also known as Tahu-nui-i-te-raki


²⁹⁴ Also known as Kaikorai in Otakou and Pākehā common name is Westland Petrel






KĀREWAREWA Bush Hawk - Falcon novaeseelandiae 	1. A kārewarewa flies about, screaming on a fine day 2. A kārewarewa flies about, screaming on a rainy day	1. The next day rain is expected 2. The next day will be fine	Iwi: Kāi Tahu: Kaikōrero: Raumumu Ahuka: Andersen, 1907, p. 343 Ahuka whakaahua: Craig Mackenzie - nzbirbsonline
KARU HUKA White caps 	White caps appear within the Bluff Harbour	Westerly (wawa) blowing. Stronger winds expected bringing rainfall from that quarter.	Iwi: Ngāi Tahu Hapū: Kāi Tūahuriri, Kāti Huirapa Takiwā: Te Taurapa o te waka Kaikōrero: Hana Morgan Ahuka whakaahua: Chris Howell – Shipspotting.com
KOHU Fog   	Fog suspended on top of the Tari-a-Te-Kaumira Range (Mt Nimrod) near Waimate and then descending downwards Fog suspended on top of Te Whiwhi hill 1. Fog descending down in a tongue shape from Oteoka Hill 2. Fog spread out and descended level	Rain imminent Rain imminent 1. South west wind accompanied with rain expected 2. Fine weather followed	Iwi: Kāi Tahu: Takiwā: Waimate Kaikōrero: H Te Maire & Rawiri Te Maire Ahuka: Beattie, 1994, p. 199 Ahuka whakaahua: David Wall - Flickr Iwi: Kāi Tahu: Takiwā: Pukeuri Kaikōrero: H Te Maire & Rawiri Te Maire Ahuka: Beattie, 1994, p. 199 Ahuka whakaahua: Kate Pedley - Flickr Iwi: Kāi Tahu: Takiwā: Wairewa (Lake Forsyth) Kaikōrero: 'Tom Billy' (Hoani Haupere) Ahuka: Beattie, 1994, p. 361 Ahuka whakaahua: Bruce Gayther - Flickr




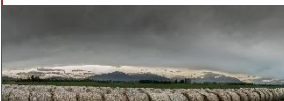
KŌPARAPARA Bell-bird - <i>Anthornis melanura</i> 	Kōparapara heard screeching in the morning.	Rainfall imminent.	Iwi: Ngāi Tahu Takiwā: Murihiku Ahuka: Transactions and Proceedings of the Royal Society of New Zealand http://rsnz.natlib.govt.nz/volume/rsnz_52/rsnz_52_00_000710.html Ahuka whakaahua: Sid Mosdell - Wikimedia Commons
KŌTUKUTUKU NZ Fuchsia - <i>Fuchsia excorticata</i> 	The leaves ²⁹⁵ seen turning upwards exposing the silvery underneath of the leaf	Heavy downpour expected, a marakai	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Helen Rasmussen Ahuka whakaahua: Tony Wills – Wikimedia Commons
KOUKOU Morepork - <i>Ninox novaeseelandiae</i> 	<ol style="list-style-type: none"> 1. Repeated one cry through the night 2. Two or more answering each other for a certain time during the night 	<ol style="list-style-type: none"> 1. Bad weather expected 2. A signal that storms are on their way 	Iwi: Kāi Tahu Hapū: Kāti Wheke Takiwā: Rāpaki Kaikōrero: Teone Taare Tikao Ahuka: Beattie, 2009, p. 409 Ahuka whakaahua: Aviceda – Wikimedia Commons
KŪAKA Bar-tailed godwit - <i>Limosa lapponica</i> 	Paired Kūaka entering a burrow	Fine weather is expected the next day.	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Tony Whitehead - nzbirdsonline
MARINO TE MOANA	<ol style="list-style-type: none"> 1. Calm sea conditions 	Bad weather imminent	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Makāwhio Takiwā: Te Tai Poutini






²⁹⁵ The Horoeaka (Lancewood – *Pseudopanax crassifolius*) behaves in the same way




<p>Calm sea</p> 	<p>2. Clouds tracking north</p> <p>3. Roaring sea from the north</p>		<p>Kaikōrero: Paul Wilson</p> <p>Ahuka whakaahua: Ngaire Hart Lawson - Flickr</p>
<p>MŌHUA Yellowhead - <i>Mohoua ochrocephala</i></p> 	<p>Mohua suddenly rises above the forest canopy and then falls back amongst the trees</p>	<p>Storm about to strike</p>	<p>Iwi: Ngāi tahu</p> <p>Ahuka: Gordon, 1938, p. 170</p> <p>Ahuka whakaahua: Thomas Mattern - Wikimedia Commons</p>
<p>NAMUNAMU NZ Sandfly – <i>Austrosimulium unguatum</i></p> 	<p>Swarms of namunamu start biting aggressively</p>	<p>Rainfall is expected</p>	<p>Iwi: Ngāi Tahu</p> <p>Hapū: Kāti Mahaki</p> <p>Takiwā: Makāwhio, Te Tai Poutini</p> <p>Kaikōrero: Paul Wilson</p> <p>Ahuka whakaahua: Kimba Mallowes - Flickr</p>
<p>NAONAO Midges – <i>Chironomus zealandicus</i></p> 	<p>Naonao flying around at dusk</p>	<p>Fine weather expected</p>	<p>Ahuka: Beattie, 1994, p. 199</p> <p>Ahuka whakaahua: Phil Bendle – T.e.r.r.a.i.n</p>
<p>PAIA Easterly</p> 	<p>Easterly blowing for more than a week</p>	<p>Rainfall follows</p>	<p>Iwi: Ngāi Tahu</p> <p>Takiwā: Ōtautahi</p> <p>Ahuka: Beattie, 1994, p. 360</p> <p>Ahuka whakaahua: Dave Allen - NIWA</p>

PAORO-RIMU-HUARERE Kelp weather-glass 	1. Kelp weather-glass is full of air and hard to the touch 2. Kelp weather-glass is spongy and soft to the touch	1. Fine weather ahead 2. Rain is imminent	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Tsaleh - Tarik Saleh
PARARA Broad billed Prion - <i>Pachyptila vittata</i> 	Parara arrive on the tītī mutton-birding Islands during the night	Gales and heavy rainfall expected the next day.	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Douglas Koch - Flickr
PĀTĪTĪ Grass - Poa 	1. The grass is wet 2. The grass is dry	1. North east wind will blow 2. A southerly wind will blow	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Phil Bendle – T.e.r.r.a.i.n.
PĪWAIWAKA Fantail - Rhipidura fuliginosa 	Pīwaiwaka catching insects by the river	Rain imminent	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Homes Ahuka whakaahua: Robert Engberg - Wikimedia Commons
PĀOA Smoke 	Smoke plume forced downwards draft by a sudden drop in pressure	Rainfall imminent	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Helen Rasmussen Ahuka whakaahua: Patrick Ouellette – pressherald.com
PORAKA	Silence of the night is broken when Brown	Rainfall the next day.	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua

<p>Brown Tree Frog – <i>Litoria ewingii</i></p> 	<p>Tree Frogs are heard whistling and croaking</p>		<p>Takiwā: Te Umukaha Kaikōrero: Mandy Waaka Home Ahuka whakaahua: JJHarrison - Wikimedia Commons</p>
<p>PUAKA Rigel</p> 	<ol style="list-style-type: none"> 1. Puaka appears south of the sunrise 2. Puaka appears north of the sunrise 3. Puaka appears in the path of the sun 	<ol style="list-style-type: none"> 1. Bad weather is expected 2. Fine weather is expected 3. Much heat and dryness is expected 	<p>Iwi: Ngāi Tahu Ahuka: Beattie, 1994, p. 364 Ahuka whakaahua: Robert Gendler - Wikimedia Commons</p>
<p>RIMURAPA Bull Kelp – <i>Ecklonia radiata</i></p> 	<ol style="list-style-type: none"> 1. Kelp is flaccid 2. Kelp is turgid 	<ol style="list-style-type: none"> 1. Fine weather ahead 2. Wet weather ahead 	<p>Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Tā Tipene O'Reagan Ahuka whakaahua: Craig Stevens - NIWA</p>
<p>TAHUPOKAI Red sky</p> 	<p>Red sky all around the horizon at dusk</p>	<p>Fine weather expected</p>	<p>Iwi: Ngāi Tahu Takiwā: Ōtautahi Ahuka: Beattie 1994:361 Ahuka whakaahua: Alan Blacklock - NIWA</p>
<p>TAIPUA Cumulo-nimbus</p> 	<ol style="list-style-type: none"> 1. Hazy, towering black clouds building up at the back of Te Tari-o-Te-Kaumira (Hunter Hills) moving north. 2. Taipua clouds moving in an anti- 	<ol style="list-style-type: none"> 1. High possibility of snowfall (4 hours later) on the Southern Alps. 	<p>Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka Homes Ahuka whakaahua: Mrs Puff - Flickr</p>

	clockwise direction towards Timaru and moving north towards Banks Peninsula.	2. Storm front usually drops snow over Banks Peninsula.	
TAKATA-WAIRUA Ghost moth - <i>Heloxycanus patricki</i> 	Ghost moths observed flying near a light source.	Light, misty rain expected the next day	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Home Ahuka whakaahua: D. Patterson – Te Ara
TARAHAOA Mt Peel 	A thin, 'collar-like' cloud surrounds Tarahaoa (Mt Peel)	Rain imminent within three days.	Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: Aardvark – NZ Trumper
TE IKA-A-RAKI Milky Way 	1. Te Ika-a-Raki is curved 2. Te Ika-a-Raki is straight	1. Bad weather expected 2. Fine weather expected	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: David Reneke – davidreke.com
TE MĀURU North-west Arch 	A mass of dark clouds begin to form above the Southern Alps. Blue sky is seen above and below these clouds.	A southerly is expected the next day. The strength of the southerly depends on the height of the arch above the mountains.	Iwi: Ngāi Tahu, Waitaha Takiwā: Ōtautahi Kaikōrero: Mātakiwi Wakefield Ahuka whakaahua: Shannan Crow - NIWA
TIEKE	Tieke fly to the protected western side of the island or the east wind perch.	Wind from the east imminent.	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger

<p>Saddleback - <i>Philesturnus carunculatus</i></p> 			<p>Ahuka whakaahua: David Reneke – NZ Bird on line</p>
<p>TOKA 'Honest wind' - Southerly</p> 	<ol style="list-style-type: none"> 1. Rain with no wind before a southerly 2. Rain accompanied with wind before a southerly 	<ol style="list-style-type: none"> 1. Southerly will hang around Kaikoura for 2-3 days 2. Southerly will pass through Kaikoura quickly 	<p>Iwi: Ngāi Tahu Hapū: Kāti Kurī Takiwā: Kaikoura Kaikōrero: Maurice Manawatu Ahuka whakaahua: Dave Allen - NIWA</p>
<p>TŌRINO Eardrum</p> 	<p>Ringling sound in the ear drum</p>	<p>Warning that rain was imminent</p>	<p>Iwi: Ngāi Tahu Ahuka: Beattie, 1994, p. 360 Ahuka whakaahua: John C Abell - Flickr</p>
<p>TŪPOUPOU Hector's Dolphin - <i>Cephalorhynchus hectori</i></p> 	<p>Hector's Dolphins are unusually excited in the wake of boats during summer</p>	<p>Storm on its way, driven by a northerly</p>	<p>Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Paul Wilson Ahuka whakaahua: James Shook – Wikimedia Commons</p>
<p>UMU Lunar halo</p> 	<p>Lunar halo</p>	<p>Sign of wind. Sometimes indicated fine weather and when a complete halo, heavy fog</p>	<p>Ahuka: Beatties, 1994, p. 360 Ahuka whakaahua: Matthew Davidson – Wikimedia Commons</p>

UMU Solar halo 	1. Vivid solar halo encircles the sun 2. A pale, dim halo encircles the sun	1. A storm is approaching 2. A storm is far off	Ahuka: Beatties, 1994, p. 360 Ahuka whakaahua: Pankaj Kr Mandal - Wikimedia Commons
WAHANUI Norwester 	Wahanui starts to blow	Flattens the sea off Te Umukaha coast, allowing fishing and diving to occur	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: Doug Stevens – Fishingmag.co.nz
WAIPUKETAKA Flooding 	Rising level of the Kapuka Creek	Rain imminent	Iwi: Ngāi Tahu Hapū: Kāti Waewae Takiwā: Arahura, Te Tai Poutini Kaikōrero: Hector Tainui Ahuka whakaahua: Daniel Murray - Flickr
TOTAL - 47			





I discussed my thoughts with my research team about how astonished I was at the diversity of fauna and flora, the different native birds, atmospheric and astronomical phenomena that were identified as either a weather, climate or seasonal indicator.



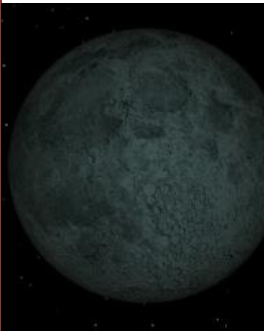

Matapae Āhuaraki - Climate Prediction



Climate indicators underpinned by an astute knowledge of local maramataka²⁹⁶ allowed customary harvesters to plan accordingly for the conditions they could expect for that season or for that year. In Tēpu 9.9 are listed and identified a number of climate indicators along with an explanation outlying the expected outcome. These Ngāi Tahu climate tohu are sourced mainly from the participants who are identified.

²⁹⁶ Lunar environmental calendar

TĒPU 9.9: KĀ TOHU ĀHUARAKI – CLIMATE INDICATORS

IKOA NAME	TOHU INDICATOR	WHAKATAUKA EXPECTED OUTCOME	IWI ROHE KĀIKŌRERO AHUKA TRIBE REGION INFORMANT SOURCE
AUTAHĪ Canopus 	Autahi is seen standing far apart from the milky way during the month of October	A dry summer will follow	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: NASA – Wikimedia Commons
HARAKEKE <i>Phormium tenax</i> - Flax 	Early flowering of the koladi stem (korari)	Long, dry summer is expected	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Phil Bendle – T.e.r.r.a.i.n
KŌHAI <i>Sophora tetraptera</i> 	1. A mixture of blooms sticking up and down. 2. All blooms drooping. 3. All blooms erect.	1. Indicates a mixed year ahead. 2. Indicates a cooler year ahead. 3. Indicates a warmer year ahead.	Iwi: Ngāi Tahu Hapū: Kāti Wheke Takiwā: Rāpaki Ahuka: Beattie, 1994, p. 361 Ahuka whakaahua: Velela – Wikimedia Commons
KOHU MOANA Sea fog 	1. Sea fog rolling in from the east along the Whakaraupō Harbour towards Rāpaki 2. Numerous sea fog events take place	1. Cold, wintry conditions are on the way 2. Colder than normal conditions for the season can be expected	Iwi: Ngāi Tahu Hapū: Kāti Wheke Takiwā: Whakaraupō Kaikōrero: Yvette Couch-Lewis Ahuka whakaahua: Karen Andelan - Flickr

KŌTUKU White Heron – <i>Ardea modesta</i> 	The kōtuku are plentiful in summer along the West Coast at Ōkārito	Gales and a heavy winter will follow	Iwi: Ngāi Tahu Hapū: Kāti Waewae, Takiwā: Te Tai Poutini Ahuka: Riley, M. (2001). <i>Maori bird lore</i> . Viking Seven Seas NZ, Ltd., Paraparaumu, New Zealand. Ahuka Whakaahua: Dave Murray - DoC
KŌTUKUTUKU NZ Fuchsia – <i>Fuchsia excorticata</i> 	The leaves of the Kōtukutuku are seen dropping to the ground.	Winter is on its way.	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Helen Rasmussen Ahuka whakaahua: Tony Willis – Wikimedia Commons
MARAMA KOROHITI New Moon 	1. Fine weather during the new moon phase 2. Wet weather during the new moon phase	1. Fine weather expected for most of the month 2. Wet weather expected for most of the month	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: funbob – Bob's Blog
MARAMA OHUA Crescent Moon 	Crescent moon seen lying on its back	Drier conditons expected for that month	Iwi: Kāti Māmoë, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Nirupam Sarker – Wikimedia Commons
PUAKA	1. In June, Puaka rises, twinkling and flashing its rays towards the south	1. An unsettled, windy, cooler and lean year ahead	Iwi: Ngāi Tahu Ahuka: Te Karaka, 2000, p. 28; Cowan, 1930, p. 89; Beattie, 1994, p. 363

<p>Rigel</p> 	<p>2. Puaka rises, twinkling and flashing its rays towards the north</p>	<p>2. A year of bounty on land and sea, and settled, warmer conditions ahead</p>	<p>Ahuka whakaahua: Robert Gendler - Wikimedia Commons</p>
<p>PŪTAKITAKI Paradise Duck – <i>Tadorna variegata</i></p> 	<p>Pūtakitaki nesting near the river</p>	<p>Dry summer season ahead</p>	<p>Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Homes Ahuka whakaahua: Michael Marshall – Flickr</p>
<p>RĀKAUNUI Full Moon</p> 	<p>Wet weather during a full moon lunar phase</p>	<p>Wet month expected, it will be more wet than not</p>	<p>Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Paul Wilson Ahuka whakaahua: Tomruen – Wikimedia Commons</p>
<p>RĀTĀ Southern Rata - <i>Metrosideros umbellata</i></p> 	<p>Profuse flowering of the rātā from the bottom upwards</p>	<p>Very dry, hot summer, drought-like conditions</p>	<p>Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Estelle Leask Ahuka whakaahua: Phil Bendle - T.e.r.r.a.i.n</p>
<p>RIRORIRO</p>	<p>1. The Riroriro builds a nest high in the tree-tops 2. The Riroriro chooses to build a home low down among sheltering branches</p>	<p>1. Mild westerly winds will ensure a warm summer 2. Cold southerlies expected</p>	<p>Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: Neil Fitzgerald - neilfitzgeraldphoto</p>

Grey Warbler – <i>Gerygone igata</i> 			
TĪ KOUKA Cabbage Tree - <i>Cordyline australis</i> 	1. Profuse early flowering 2. Late flowering	1. Long, dry summer ahead. 2. Wet summer expected	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka-Home Ahuka whakaahua: Alan Blacklock - NIWA
TOTAL - 13			





Matapae Wāhaka o Te Tau - Seasonal Prediction





The Ngāi Tahu names for each season of the year are; Makariri/Takurua for Winter, Kana for Spring, Raumati for Summer and Kāhuru for Autumn. Environmental indicators such as the endemic, deciduous kōtukutuku²⁹⁷, signalled to local Māori the transition from Kāhuru to Makariri when the leaves dropped to the ground. A senior pōua explained to us the importance of upholding their customary practices and the gift of reconnecting back to their whenua, “The minute I’m back on the tītī Islands it’s like...I’m back, I’m home again...we think of our ancestors...they walked these tracks...we are not alone and you know that and that’s why it’s so special”.

Tēpu 9.10 displays a number of seasonal indicators that marked a movement from one seasonal phase to another. Like previous tēpu, tohu are identified along with a description of the expected outcome. Main sources are the participants with only a couple sourced from a secondary source.

²⁹⁷ NZ Fuchsia, see table below

TĒPU 9.10: KĀ TOHU WĀHAKA O TE TAU – SEASONAL INDICATORS

IKOA NAME	TOHU INDICATOR	WHAKATAUKA EXPECTED OUTCOME	HAPŪ TAKIWĀ AHUKA KAIKŌRERO TRIBE REGION SOURCE INFORMANT
HAO Momo Tuna 	The day is rough with a south-west wind and the night is dark (hinapouri).	Hao should be running. Harvesting is expected to be very successful during March months.	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka- Home Ahuka whakaahua: Gusmonkey Boy – Wikimedia Commons
KANAKANA Lamprey - <i>Geotria australis</i> 	1. Kanakana come up the Opihi River (inland of Te Umukaha) to spawn during the rising of Puaka (Rigel). 2. Kanakana come up the Maitaia River to spawn at night during a new moon when it is dark. Heavy rainfall.	1. Beginning of the new year in June 2. Kanakana caught in great numbers near the Maitaia Falls from October to December	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka- Home Ahuka whakaahua: Peter Anderson (DoC) – Wikimedia Commons Iwi: Ngāi Tahu Takiwā: Maitaia Kaikōrero: Rewi Anglem Ahuka: Beattie, 1994, p. 148
KIEKIE <i>Frecinetia banksii</i> 	1. Male kiekie produces succulent, fleshy bracts called wharawhara. 2. Female kiekie produces 3-4 fruit called tāureure.	The fruit ripened during the month of May - Kāhuru	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Paul Wilson Ahuka whakaahua: Phil Bendle - T.e.r.r.a.i.n
KOEKOEĀ Long-tailed Cuckoo - <i>Endynamys taitensis</i> 	The cry of the koekeā	Heralds the commencement of Summer	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Wai Pounamu Kaikōrero: Helen Rasmussen Ahuka whakaahua: Adam Clarke – nzbirdsonline

KŌTUKUTUKU NZ Fuchsia – <i>Fuchsia excorticata</i> 	Tui and kereru seen feeding on the berries	A sign that kōtututuku berries known simply as hua kōtututuku or konini are ready to be harvested in January	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Paul Wilson Ahuka whakaahua: Paul Davey – Wikimedia Commons
PĀTŌTARA Dwarf mingimingi - <i>Leucopogon fraseri</i> 	Weka and kiore seen eating pātōtara ²⁹⁸ during summer	Indicator to local Māori that 'Kā rā o te waru' or the dry months of summer has arrived and that pātōtara are ready to eat. Produces a small yellow, orange, edible berry. Dies away in Winter	Iwi: Ngāi Tahu Takiwā: Otakou Ahuka: Te Karaka 2017 Ahuka whakaahua: Phil Bendle - T.e.r.r.a.i.n
PĪPĪWHARAUA Shining Cuckoo - <i>Chrysococcyx lucidas</i> 	The cry of the Pipiwharau	Heralds the commencement of Spring	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Homes Ahuka whakaahua: John Kendrick - DoC
PŪAWĀNAKA NZ Clematis – <i>Clematis paniculata</i> 	Early flowering of Pūawānaka	Excellent white baiting season expected Signals the approach of spring	Iwi: Ngāi Tahu Hapū: Kāti Mahaki Takiwā: Makāwhio, Te Tai Poutini Kaikōrero: Paul Wilson Ahuka whakaahua: Phil Bendle - T.e.r.r.a.i.n
PŪTAKITAKI	From December to March the feathers of the Pūtakitaki moult	Pūtakitaki were chased around the lake and corralled into pens constructed specifically to hold them	Iwi: Ngāi Tahu Takiwā: Waihora Ahuka: Beattie, 1994,336 Ahuka whakaahua: Michael Marshall – Flickr

²⁹⁸ The berries are the size of currants and taste like apricots. Produces a fragrant perfume.

Paradise Duck – <i>Tadorna variegata</i> 			
REHUA Antares 	The star Rehua seen in the night sky	Signals the commencement of summer	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Puketeraki Takiwā: Waikouaiti Kaikōrero: Khyla Russell Ahuka whakaahua: ESO/B. Tafreshi (twanight.org)
TĪ RĀKAU Cabbage Tree – <i>Cordyline spp</i> 	Inaka start to run up the Orari, Rakitata and Omihi Rivers during early September	Signals to Kāti Huirapa ki Arowhenua to start processing the tī roots known as kāuru. This continues until March	Iwi: Ngāi Tahu Hapū: Kāti Huirapa ki Arowhenua Takiwā: Te Umukaha Kaikōrero: Mandy Waaka- Home Ahuka whakaahua: Alan Blacklock – NIWA
TOREA Pied Oystercatcher – <i>Haematopus ostralegus finschi</i> 	Arrival in Murihiku	Heralds the commencement of summer	Iwi: Kāti Māmoe, Ngāi Tahu, Waitaha Takiwā: Te Taurapa o te waka Kaikōrero: Graham Tiny Metzger Ahuka whakaahua: Paul Davey – Wikimedia Commons
WEKA	Arrival of Tītī to Te Taurapa-o-Te Waka	Signals to the locals that harvesting of Weka can start from April to July.	Iwi: Ngāi Tahu, Kāti Mamoe, Waitaha Takiwā: Awarua, Te Taurapa-o-Te-Waka Kaikōrero: Graham Tiny Metzger Ahuka: Beattie, 1994, p. 335

<i>Gallirallus australis</i> 			Ahuka whakaahua: Jorg Hempei – Wikimedia Commons
TOTAL: 14			

6. Tirohaka Whānui - Longitudinal Observation

First and foremost, I received a unanimous response that climate change was a reality. All participants provided a response when asked to identify what longitudinal observations of climate change they had noticed during their lifetime. The interviewees left no room for confusion as far as they were concerned and backed this up with many examples. The changes are so significant that some of their traditional weather and climate indicators are no longer reliable. They say the seasons are out of whack. And since the Ōtautahi earthquakes, some elders believe that the stars are also out of alignment.

Other examples given were longer summers and milder winters are now more frequent than not. Rivers are drying up, causing a lot of stress and often death of plants and animals due to long, hot droughts. The natural habitats for all these taoka kai are degraded or no longer exist. Higher than normal temperatures have caused prolific flowering of the rātā²⁹⁹ on Motupōhue, in turn causing both bird and pest populations to explode. Tītī are having to fly further to feed; therefore they are having to abandon their chicks. Catching Kingfish along the east coast of Te Wai Pounamu – a fish previously unknown in Ngāi Tahu coastal waters – is becoming more common.

Many of the participants talked about playing out in the bush, near swamps and creeks, catching frogs or hearing frogs, cicadas and seeing alot of blue and horse dragonflies

²⁹⁹ *Metrosideros umbellata* – southern rātā

during their youth, but the activity, the connectedness to the taiao and the biodiversity is not happening any more.

An elder said that a friend of his was growing kiwifruit on his property in Invercargill. If someone had said twenty years ago that kiwifruit would be planted in Southland no one would have taken you seriously. Murihiku interviewees stated that storm surges over the last couple of years had caused considerable damage, exposing many significant sites, causing unprecedented levels of coastal erosion and salt inundation far inland.

First-hand observation was that the terminal face of the Tasman glacier took only 40 years to melt and create a 7-kilometre lake due to global warming. Many other cultural practitioners also mentioned that they have noticed a gradual 'warming up' of the temperatures during the onset of winter. Normally, mornings would get progressively colder, with many chilly, frosty mornings. However a number of the participants remarked that it was so warm during May in the early mornings that they would be wearing shorts and singlets. Then the weather would switch overnight from 24 degrees one day to 5 degrees the next.

One of the Kāti Huirapa ki Arowhenua takata mahika kai, Karl Russell, related on a very personal level how attuned he was to environmental changes (2016):

Did I know that that was going to happen? Yes! Did I know when it was actually going to happen? No! How do I actually know this stuff? When you are gathering kai, when you are out in that environment you build up a lifetime of doing it, you build up a natural understanding of the (local) weather patterns. It comes back to the smell and taste. When you go to an awa, you know whether its clean or its paru, quite simple like that. You have that taste in your mouth of the whenua or the awa. Still to this day I don't know how, but I just know that I do, it's a natural thing. There's been changes taking place where I said it's not looking good bro. This is happening at night. We shouldn't be getting these winds this time of the day. And you'll hear the old time cockey say, "There's something not right with the weather!"

Russell's sentiment is shared by many other 'Takata mahika kai' that a lifetime of living with the land, you notice when something is not right.

7. Akoraka - Specialised Training

Many participants mentioned the collective memories of their tāua³⁰⁰ and pōua³⁰¹, who they understood were proficient in weather forecasting. However, it was intimated that after the arrival of Pākehā immigrants to Te Wai Pounamu, an 'interruption' occurred, negatively impacting on the cultural and social fabric within whānau and hapū. The loss of mātauraka taiao Ngāi Tahu or Ngāi Tahu environmental knowledge and the accompanying decline of localised environmental skills and cultural practices that previous generations had the good fortune of being the recipient, relied on that upbringing to provide guidance and to manage risk. These sentiments were repeated by many of the interviewees throughout the duration of my research journey in Te Wai Pounamu.

Pākehā were not the only ones to have a devastating affect on the knowledge transmission between the generations. The invasion by Te Rauparaha of Te Wai Pounamu in the early nineteen century brought death and annihilation to the numerous hapū of Ngāi Tahu iwi. The catastrophic impacts of the northern tribes upon the social fabric of the Ngāi Tahu people severely weakened their ability to remain resilient in the face of the growing presence of Pākehā settlers. Many tohuka skilled in the rituals, incantations and ancient knowledge of their tīpuna were killed during those times. The leading Ngāi Tahu chiefs attempted to resurrect the traditional schools of learning known as te whare pūrakau (Tau & Green, 2011, pp. 48-49).

From the beginning of the world it goes on – It cannot be rubbed out...Mana is all around the world and Tāwhiri-mātea, Rūaimoko and Māui and others are at the centre of the circle and get hold of his mana and direct the elements and make the weather. The Hine family hold the winds by the mana. No one can rub it out. Māui is not dead, but Hine-nui-te-pō (goddess of death) took his mana and it still exists. The atua stand back to back doing the work of the world-good or bad and doing it by mana, which could not be put out or overcome ...Mana holds from the beginning to the end of the world and it keeps the world going. Personal mana can be overcome or annihilated, but that of the atua cannot (Tikao & Beattie, 1990, pp. 95-96)

Examples of tohunga who were known to have the ability to influence the weather were Tūtemākohu, Tūahuriri, Pāoa and Tuaroro-o-rangi.

³⁰⁰ Elderly male (Ngāi Tahu dialect)

³⁰¹ Elderly female (Ngāi Tahu dialect)

TŪTEMĀKOHU: The celebrated Kāti Mamoe fighting warrior priest, Tūtemākohu and his whānau were hunted relentlessly by Kāi Tahu. One of his enemies Te Tūtekahikura kidnapped his wives. Tūtemākohu sought him out and despite being outnumbered, challenged him to a duel. If he won, he could take his wives and depart. In spite of the fact that he was smaller than Tūtekahikura, he was still successful in defeating him. Tūtemākohu and his whānau were forced to withdraw to the north of the Hokonui hills down on to the Waimea Plain to escape to his relatives pā, Marakai at Tāherehaka – Kingston near Lake Wakatipu.

Unfortunately they were overtaken at Waitaramea, known now as the Oswald stream. Carelessly Kāi Tahu attacked resulting in the death of Kaweriri, the leader of the war party. His death caused disarray and confusion amongst his Ngāi Tahu forces allowing Tūtemākohu and the remnant of his people to escape climbing the slopes of Tarahaukapiti. When he saw that he was being pursued he called upon his gods to save him³⁰². A thick, dense fog enveloped him hiding him from sight (Tau, 2008, pp. 124-128).

TŪĀHURIRI: The illegitimate son of Te Aohikuraki and Rākaitekura, and named Te Hikutawatawa-o-te-raki at birth. He grew up to be a tohuka makutu and a renowned warrior of note. After suffering a disastrous defeat at the hands of Hikaororoa and Tū-te-kawa war party at Te Mataki-Kaipoina Pā, near Point Halswell, Miramar, Tūahuriri was allowed to escape by Tū-te-kawa's nephew Turuki. Tūahuriri warned Tū-te-kawa not to venture to far out to sea as he had asked his gods to raise a storm to destroy Hikaororoa's returning war canoes within the Raukawakawa Strait³⁰³. Tūahuriri's prayers were answered by sending a violent storm known as Te Hau-o-Rongomai (Tau, 2008, pp. 50-57; Best, 1901, p. 142).

PĀOA

A natural leader and tohuka, Pāoa heard noises outside his whare. Two survivors of the fall of Kaiapoi Pā, destroyed by Ngāti Toa war general Te Rauparaha, Raki-roa and Taki-

³⁰² See pages 336-337, to view the karakia that Tūtemākohu uttered to render himself invisible by cloaking himself in fog.

³⁰³ Cook Strait

reia let Pāoa know their people are no more. Pāoa exclaims that he had a dream of a oven, “an oven like this, an oven like that, a heaped up oven...” Other survivors who heard that Raki-roa and Taki-reia had survived rushed to attack them. Pāoa stepped forward and uttered a karakia that raised a great wind, forcing them to return without them (Tau & Green, 2011, pp. 28-29).

TUARORO-O-RANGI

Ngāi Tahu had serious plans to take over the pounamu resource from Ngāti Wairangi on Te Tai Poutini for themselves. Te Rakitaumu led the first assault killing senior Ngāti Wairangi rakatira, Te Uekanuka. However as the Ngāi Tahu war party returned across the Southern Alps, Tuaroro-o-rangi through his mana and karakia, caused a blizzard to overwhelm them (Mitchell & Mitchell, 2004, p. 87).

8. Whakariteka me kā Taputapu – Application and Tools

The following are two key examples that Ngāi Tahu used; karakia and Maramataka. There may be others but I have only managed to identify these two.

Karakia

No doubt there are many other karakia that Ngāi Tahu and other iwi from Te Wai Pounamu used. A number of participants explained the fall of kaiapoi Pā to Te Rauparaha and his war party, particularly when the resident tohuka commenced his karakia and at its conclusion commanded the burning of fire outside the palisades to drive Te Rauparaha’s forces away. Te Rauparaha ordered Houa, a Rangitāne tohunga to counter the mana of the Ngāi Tahu tohuka. The story goes that the winds that were forcing the Ngāti Toa warriors to retreat, all of a sudden swung back towards the pā. Within a short period of time, the palisades started to burn, allowing the invading army to force their way into the pā. Houa had observed the natural phenomenon of the Te Māuru or the Nor’west arch that it contends with a southerly. This is the wind, a hau toka, which caused the eventual downfall of Kaiapoi Pā (Mitchell & Mitchell, 2004, pp. 36, 64, 119, 121, 453).

Tau & Green (2011) identify a number of karakia taught at the whare pūrākau, a traditional Ngāi Tahu learning institution. They are:

Karakia tāhū mō waho i te moana ki te mea ka rere te waka ka puta te hau nui – *Incantations for when a canoe is travelling offshore and a great wind appears* (pp. 80-81).

Karakia whaiwhaiā i te raki kia ua, kia taki te whaitiri - *Incantations of sorcery (sic) to make the heavens rain and for the thunder to shatter the heavens* (pp. 82-83).

Karakia tūā i te raki kia pai, kāore te ua – *Incantations for fine weather and to dispel rain* (pp. 82-83).

This is one of them. The famous Kāti Mamoe fighting chief, Tūtemākohu used the following karakia to elude his pursuer, Parakioro and Te Maiwerohia, by raising the fog to elude his Ngāi Tahu enemies:

Hikihiki i taku tapuai	<i>My feet rise from the earth</i>
Rakuraku taku tapuai	<i>And move with speed.</i>
Te whetū ka hikoia	<i>The star moves towards</i>
Te Marama ka naua	<i>The horns of the moon, prepared and waiting, the village shall fall.</i>
Homai he toroa	<i>Cloak me in mist: White as a cape of Albatross down.</i>
Nanau ana te pō	<i>Now is your moment. The cavern of death has been cleared .</i>
Ia wai koe	<i>Enter and die!</i>

Whiti ana te rā ia ia Tupaea *The rays of life shine upon Tupaea. I live!* (Tau, 2008, p. 124; Tau, 2003, p. 241).

HE KARAKIA AWA-MOANA

Wahia te awa
Putā-i-tua, Putā-i-waho
Ko te pakiaka o te rākau
O Maere-nuku, O Maere-raki
O Maere i te maro-whenua
I ruka Tāne, i raro Tāne
Pakupaku Tāne, Rakaihi Tāne
Nohaka nō te ariki, Hoatu au, e Tāne ki uta

This type of karakia was an awa moana, a karakia that calmed the sea before voyaging. Puta-i-tua and Puta-i-waho were descendants of well known Ngāi Tahu tīpuna, Rākaihautū (Beattie, 1918, p. 146).

Tēpu 9.11 identifies two Ngāi Tahu maramataka. Unfortunately, it does not explain each individual lunar phase, whether it is a rā pai (good day) or a rā kino (bad day) for a particular activity.

I am reminded when I interviewed Dr Te Maire Tau, he showed me a copy of his tipuna's maramataka. He mentioned Uncle Bill's book and how it has triggered a response within himself to delve deeper into his own whānau maramataka, to unlock the ancestral wisdom to better understand his local environment. This is by no means a unique approach where many indigenous peoples are investigating, or deconstructing their own lunar calendars to gain a unique insight to ancestral knowledge:

Maramataka

TĒPU 9.11: KĀ MARAMATAKA O NGĀI TAHU

NAMA O NGĀ PŌ LUNAR PHASE	TE TAPIHA TE WANIKAU ³⁰⁴ KĀTI KURĪ	SAMUEL ROBINSON ³⁰⁵ KĀTI IRAKEHU
1.	Whiro	Whiro
2.	Tīrea	Tīrea
3.	Hoata	Hoata
4.	Ōue	Ōenuku
5.	Ohua	Ōkoro
6.	Tamatea (1)	Tamatea-tuatahi
7.	Tamatea (2)	Tamatea-tuarua
8.	Tamatea (3)	Tamatea-tuatoru
9.	Tamatea (4)	Tamatea-tuawhā
10.	Huna	Huna
11.	Ari	Ohua
12.	Māwharu	Māwharu
13.	Maurea	Hotu
14.	Ohua (Full Moon)	Atua
15.	Turu	Oturu
16.	Rākaunui	Rākaunui

³⁰⁴ Williams, 2004, p. 103

³⁰⁵ Robinson, 2005, p. 132

17.	Rākaumau-ohi-rā	Rākau-matohi
18.	Takirea	Takirau
19.	O-Ike	Ōike
20.	Ōkoro	Korekore-te-whiwhia
21.	E-Mauri	Korekore-te-kerekere
22.	Korekore (1)	Korekore-te-tamaua
23.	Korekore (3)	Tangaroa-ā-mua
24.	Korekore (2)	Tangaroa-ā-roto
25.	Tangaroa-amua	Tangaroa-kiokio
26.	Tangaroa-aroto	Ōtāne
27.	Tangaroa-kiokio	Ōrongonui
28.	A-tāne	Mauri
29.	Ō-rongonui	Omutu
30.	O-rongo-mutu	Mutuwhenua
31.	Mutuwhenu	

HE WHAKARĀPOPOTOTANGA - SUMMARY

The majority of the participants could not converse in Te Reo Ngāi Tahu, however they have still retained many of their customary practices, unlike other iwi. Ngāi Tahu have undertaken a rigorous campaign to improve the capacity of Ngāi Tahu reo speakers. They also have spent most of their lives in their kaik, some had moved to the cities in search of employment, but had returned in later life to retire. The following is how the Ngāi Tahu inventory of environmental knowledge of weather, climate and seasons fared:

1. **Worldview:** Ngāi Tahu identified (1) worldview based around the 'spiritual winds' and the 'pounamu'.
2. **Te Ao Wairua:** Ngāi Tahu kaumātua identified many forms of tohu aituā, and tohu mate (4).
3. **Ngā Maumaharatanga:** Ngāi Tahu identified (17) whakataukī, (29) wāhi ingoa, and no waiata.
4. **Ngā Whakarōpūtanga:** Ngāi Tahu identified (17) ngā momo ua, (67) ngā momo hau, and (12) ngā momo kapua.
5. **Ngā Tohu Taiao:** Ngāi Tahu identified (47) ngā tohu huarere; (13) ngā tohu āhuarangi; and (14) ngā tohu o te tau.

6. **Tirohanga Whānui:** All participants recognised marked changes during their lifetime in the climate. The number of changes identified were (17).
7. **Akoranga:** Ngāi Tahu identified one tohuka (4), Tū-te-makohu, Tūahuriri, Te Wera, and Tuaroro-o-raki.
8. **Ngā whakaritenga:** Ngāi Tahu identified (1) karakia, and (2) maramataka.

A total of **245** weather, climate and seasonal components were identified using the NWTW model to determine the health of Ngāi Tahu environmental weatherlore. Compared to the last two case studies, Ngāi Tahu has double the amount of weather, climate, seasonal and spiritual phenomena identified. However, this does not mean that Ngāi Tahu have retained more localised knowledge than Hauraki-Tainui or Te Whānau-a-Apanui, but it clearly demonstrates that if one has the resources and the networks to do a thorough research much can be achieved.

Ūpoko Tuangahuru: He Kupu Whakamutunga – Key Findings and Recommendations

All the participants contributed significantly to providing answers to the research questions posed to them, as the results from the three case studies clearly demonstrate. The following discussion revisits the key questions posed at the beginning of the thesis in Ūpoko Tuatahi, and seeks to answer them based on the data gathered, the face-to-face kōrero with elders and practitioners, and the unique experiences throughout the PhD journey, in order to meet the expectations of those who believed in this kaupapa.

WHAT IS THE CURRENT STATUS OF MEK OF WEATHER AND CLIMATE IN AOTEAROA?

The simple answer is that if nothing is done urgently this mātauranga will be lost across all three iwi. Like many cultural practices of the Māori, the threat of MEK of weather and climate being lost forever is real. The generation gap between active practitioners and others is getting wider and wider. Many participants told me that they are not confident that the next generation is willing to “follow in their parents’, or uncles’, or aunties’ footsteps”. They were emotional moments hearing such raw and personal insights being shared. I understood the tears, what they were sharing with me; the generations of their tūpuna who had developed this localised body of knowledge over a millenia, were on the brink of sliding into oblivion forever, unless something drastic is done now.

When asked if this body of localised knowledge was worth revitalising, the majority of the participants responded positively. I again asked them why restore this mātauranga when Pākehā weather forecasting technologies like radar or satellites provide highly accurate predictive models. Participants’ collective responses were that although they have always tried to maintain the forecasting skills of their elders, although many could not speak Te Reo Māori, they always viewed what little knowledge that was handed down they retained with much pride; a treasured taonga that connected them to their ancestors. The participants said, “*It is a constant struggle to keep this mātauranga alive as more learned practitioners pass away*”. They likened it to a tribal archive being lost

with each passing. One active tītī mutton-birder said, “It is hard to keep this knowledge going if you’re not living it”.

Over a short period of time, whānau are becoming more disconnected, forgetting when to go out, what to look for, how to do it; that inner intuition is leaving them. Retaining this ancient, localised body of knowledge is quickly losing its importance in the face of new challenges and new values; it is increasingly difficult to uphold.

The reliance of Hauraki-Tainui, Te Whānau-a-Apanui and Ngāi Tahu on environmental knowledge of weather and climate has waned as a consequence. However, the rapid disappearance of traditional weather and climate knowledge still concerns many current Ngāi Tahu elders as it weakens their ability to predict and cope with increasing climatic extremes in an ever-changing, warming world. The loss of traditional dissemination practices amongst whānau who were the kaitiaki for harvesting specific taonga kai³⁰⁶ species means they are struggling to retain effective practices and procedures for the sustainable use of their natural resources.

HOW DOES ONE LEARN HOW TO PREDICT THE WEATHER?

Karl Russell (2016) stated that learning how to predict daily weather events is not an exact science. However, living in a particular location for many generations allows local communities to test and ground-truth their assumptions by observing all the environmental indicators to improve their predictions until they are able to achieve a high degree of accuracy. Over a long period of time, weather prediction becomes intuitive. The older generation had the responsibility of passing on this type of localised knowledge to the younger generation to ensure that any innovations, any new learnings, became part of the puna mātauranga.

When I asked the participants how they knew what the weather was going to be like the next day, they said, simply, “Look up at the sky, what do you notice?” After we had looked up at the sky, they would continue by asking more specific questions, like: Is it a fine day? Or is it cloudy? What type of clouds are they? High ones, medium or low

³⁰⁶ Customary food resource

clouds? What shape and colour are they? Is the wind blowing? What direction is it blowing from? How warm or cold is it? Can you smell anything; what does it smell like? What do you notice? These are some of the fundamental questions you need to understand in order to learn how to predict the weather. Every place is different. A key part is knowing the direction of the prevailing wind. Next, the topography or the 'lie of the land', can affect the type of weather your location will receive; for example, where you are in relation to a mountain range. If you are on the windward side of the mountain it is more likely to rain and you will receive the full force of any inclement weather. However, if you are on the leeward side of the mountain range, any bad weather strikes the mountain on the windward side, causing the low clouds and turbulent winds to rise high above the mountains, protecting the leeward side from most of the destructive forces of the storm.

Based on the aforementioned conceptual framework, Ngā Whenu Tapu e Waru, Māori and other indigenous peoples relied on many things to understand what type of weather they could expect daily, monthly or on a seasonal basis. Three key themes were identified that you need to understand intimately in order to predict the weather with a reasonable degree of accuracy. They are:

1. **Locate a position to read the weather:** Identify an area from which you can view the environment with ease. A 360 degree view is ideal, and at the very least an east-west orientation, so you can follow the arc of the sun and moon. Before you begin, you need to connect physically, mentally and spiritually. You connect by conducting karakia. You need to commit yourself to making predictions from the same location, using the same observation point, at least 3 times a week. By committing yourself, your ability to see greater detail and any changes is enhanced. Consistency is key.
2. **Rangi (sky):** Look above at the stars and star constellations, such as Puanga or Matariki; predictions are made for the following season. Get up in the morning to view the sunrise, what does it look like during sunset. Be specific? Do you see any clouds? What colours are they? What does it mean? The Maramataka is a

key part of understanding what the weather will be like for the month; identify a local maramataka and learn about each lunar phase. The crescent moon is another lunar climate sign. Haloes around the moon are a sign that the weather is going to change in about 4 days time. You need to understand the correlation between wind types (prevailing winds and those associated with rain and storms) and clouds (cirrocumulus, cirrostratus, cumulonimbus and nimbostratus – mackerel, towering, thick and dark). You need to be able to identify all these types of clouds. Identifying the first appearance of migratory birds, what are the birds doing? What are their behaviour? When do they lay their eggs? Identify the ones that herald the different seasons or different weather conditions. When do the first migratory birds start to depart and the last to leave?

3. **Papa (on the earth):** Pay attention to what is happening around you at ground level. What are you noticing with fauna and flora? Which ones are flowering and when? What does it mean when flowering is either early or late? What are the waterways saying (awa, river mouths, moana – colour, appearance)? Are different migratory species still arriving at the expected time of the year or are they coming earlier or later? Do you notice any flowering trees or shrubs during their arrival? If you live in a rural area, have you noticed anything peculiar about animal behaviour? Note their actions over time, especially if the weather becomes more unsettled or worse. The timing of these seasonal events were important to Māori to determine the availability of a particular food source. Hence keen observation is vital.

The three case studies can be used as a basis for raising understanding about how to predict local weather and climate, but nothing can substitute for getting outside and practising your observational skills. As explained previously, weather prediction is a discipline that involves strict adherence to improving ones observational skills until it becomes a habit, until it becomes intuitive. One way to improve your comprehension is to keep a diary of these observations, and use social media to establish a Māori weather

observation platform³⁰⁷. Encourage wānanga with other like minded individuals and send photos of any peculiar weather phenomena and try and find out what it means.

The key point here is not only about learning how to pay attention, to read and predict tohu, it is more than that. It is about re-establishing that intimate relationship that used to exist between our tūpuna and the natural world in order for them to notice any weather patterns and any changes too so they can protect whānau, hapū and iwi and remain safe. Ki te kore koe e puta atu, ka kore rawa koe e mau tēnei pūkenga! Me puta koe ki waho!³⁰⁸

ARE TRADITIONAL WEATHER, CLIMATE, AND SEASONAL PREDICTIONS STILL RELIABLE AND ACCURATE TODAY?

Due to land degradation, loss of habitat and clearing of native bush, coupled with climate change and loss of localised knowledge resulting from the passing of learned elders or cultural interruption and the lack of dissemination to the next generation, many of the environmental indicators are not reliable on their own. However, if a triangulation approach is taken, where multiple tohu mean the same thing, a consensus-based approach can be applied in order to determine the outcome. Another growing issue is how do you revitalise MEK when most of the environmental indicators are either extinct or on the endangered list? Hence there's a strong conservation imperative to restock local populations too, native fauna and flora (i.e. Kākā), if MEK of weather and climate is to survive.

HAS CLIMATE CHANGE IMPACTED UPON MEK OF WEATHER AND CLIMATE?

When I asked the participants if they had noticed any impacts from climate change, all interviewees replied in the affirmative. Not one person said no. They noted variable, short, sharp winters that are milder now than before. Different species of fish moving into their moana was one example. Local Māori are noticing that summers are getting a lot hotter and drier, and lasting a lot longer. When average temperatures rise, the birth rates of pests tend to increase, devastating our native bird populations as a result. Our

³⁰⁷ Our Hawaiian relations have already set up one up. See www.aimalama.org

³⁰⁸ If you don't go outside, you will not obtain this skill. So go outside!

ngahere is also dying from possums eating the berries and flowers and ringbarking our native trees. If native birds do not have any food, they cannot exist. Without the fauna and the flora a huge part of MEK cannot be used. Therefore the risks are real to the ongoing survival of this traditional weatherlore.

IS IT POSSIBLE TO INFLUENCE OR CHANGE THE WEATHER BY KARAKIA?

A literature review of Indigenous ethnometeorological environmental knowledge showed that much research has been conducted with traditional rainmakers worldwide. I have highlighted some examples in Ūpoko Tuatoru. There are many examples here in Aotearoa demonstrating that tūpuna Māori had an ability to influence the weather. In Ūpoko Tuawhā – Whare Wānanga, a number of tohunga were discussed in terms of their exploits, leading me to believe that our tūpuna found a way to connect spiritually with their atua. One example by enacting the ritual of tohi³⁰⁹; a ritual that consisted of two parts. Tāpae or dedication ritual which consisted of offering the individual to the service of a particular atua. This would be followed by an act of whakataputapu or consecration. This is done by invoking the atua's name to imbue the person with mana atua (Marsden, 2003b, pp. 4-6). Our tūpuna also built tūāhu³¹⁰, offered special food, and sometimes provided a human sacrifice, then uttered karakia and energised their words with ngeri,³¹¹ sending them out to the appropriate atua (Anderson, 2014, pp.278-286; Best, 2005, pp. 97, 132, 152, 177, 182-183; Best, 1976, p.272). Ritual feasts were also organised to influence the weather. They were called Umu Pururangi or Tuaumu-i-te-rangi; ceremonial ovens to cause the winds to drop. These types of ceremonial feasts were used to enhance the sacredness of the relationship between a tohunga and his atua (Best, 1976, pp.328-329).

LIMITATIONS OF THE RESEARCH

As previously explained, there are not many expert practitioners in this particular field of enquiry. The literature also reflected this point, and I was forced to cast my research 'net' a lot further than was first envisaged. My initial foray gathering relevant material

³⁰⁹ Sacramental rite of initiation

³¹⁰ A shrine.

³¹¹ A type of haka without formalised actions, use of impromptu actions.

under the guidance of Uncle Bill and my supervisors was reasonably successful. Those were the days when I was communicating with Uncle and my colleague Darren King quite frequently. Uncle Bill instilled a passion for this kaupapa in me and I became somewhat rudderless when he passed away. I thought that at least with Uncle Bill at my side, the PhD journey would not be as challenging. But, I soon realised the depth of my naivete in that any attempt to understand the mysteries of the weather, climate or seasons or the spiritual world through a mātauranga Māori lens without a pou like Uncle Bill, threatened to sink my ambitions to complete this thesis.

Therefore the limitations of this enquiry were identified relatively quickly in the earlier parts of the research, such as the ability to identify weather or climate indicators. Hauraki and Te Whānau-a-Apanui were a case in point regarding cloud types that gather around mountain tops. Locals often invited me to stay and observe *tohu* 'in situ' to better understand whether these indicators remained accurate. Unfortunately, having a limited amount of time meant that such prolonged stays were beyond the scope of this enquiry. Another impediment I identified with the research participants is the lack of knowing how to speak Te Reo Māori. The inability to understand Te Reo is significant in my opinion as it blocks for example, an individuals comprehension of deeper, esoterical and philosophical nuances when a wānanga or manuscripts are in Māori. Writing this thesis was an attempt to address the gaps in the initial research project with Te Kūwaha – NIWA. However, I have found that the more you find out, there are many more questions to keep challenging the researcher in this space.

AREAS FOR FUTURE RESEARCH

It would be very useful to have the opportunity to return and ground-truth this body of knowledge with other cultural practitioners I did not get the chance to meet during this investigation. At Arowhenua for example, it would be very easy to organise wānanga between the Wharekura and the kaumātua located at Te Hapa o Niu Tirenī Marae³¹² to train the next generation of Kai Tirotiro Raki or Weather Predictors. Based on the wealth of information collated from the Mataatua rohe, I would also organise a similar wānanga with Te Whānau-a-Apanui and Tūhoe, to give back to my pakeke who are no longer with

³¹² Located next door.

us. I would also like to further my understanding about how our tūpuna raised and calmed storms. I would consider applying for funding to take a small group of cultural practitioners overseas to explore the processes by which indigenous rainmakers can influence the weather, and to organise an indigenous conference in Aotearoa in the very near future. I'd like to learn more about 'indigenous knowledge' systems. I was really drawn to the supernatural element of 'rainmaking' and I learnt enough to have the confidence that there is much more out there that mainstream science cannot really explain, but that it is very real and relevant. I'd like to make more films that explore the Spiritual Universe.

CONCLUSION

The world we live in is more connected than ever before. However, as human beings we could not be more disconnected; from ourselves, from our culture and identity, and from the environment. We rely too much on other things, such as cell phones and app stores, to do what our ancestors did as part of their every day lives. In order to reconnect, we need to resync ourselves with the natural biorhythms of the environment. The key thing in practicing Māori environmental knowledge of weather and climate is that it opens up a pathway to not only reconnect with the vast expanse of the sky, the clouds, rain and winds, but with your own culture, by rediscovering your own identity. Whether you are from Kenya, Australia, Hawai'i or Aotearoa, all indigenous peoples throughout the world relied on those who were experts in the practice of predicting the weather. Some even discovered ways to influence the weather to ensure their people and their crops would not perish from weather extremes. These individuals were therefore better able to contribute to their whānau, hapū and iwi, because they had a strong sense of who they were. No matter where we are from, we see the same sun, feel its warmth, see the same moon and feel the mystery and the wonder as it arcs across the heavens. Observing the heavens is one of the times, as a practitioner, when you realise that there is something greater than you as an individual. You also realise that you're never really alone. You are part of this greater connection to Te Ao Wairua and Te Ao Kikokiko that's always with you no matter what. There is much hidden knowledge to be unlocked and learnt, by simply looking up at the sky. All the signs are there, all you have to do is look up.

The purpose of this thesis was articulated right at the beginning to explore Māori environmental knowledge, expertise, and cultural understandings of weather and climate and determine what currently exists within the Hauraki-Tainui, Te Whānau-a-Apanui, and Ngāi Tahu iwi. Here I conclude by acknowledging again all who have passed on before and during the PhD journey.

Ā, kāti rā, ka whai whakaaro au mō te atua matua o te kaupapa nei a Tāwhiri-mātea, ngā kaumātua katoa, ōku pakeke, koutou ngā teretere pūmahara kua rūpeke atu ki tua o te ārai. Kua whakatutuki te kaupapa toimaha nei, nōku te maringa nui, moe mai takoto e ngā ngongirua i roto i te kauawhiawhi o te wāhi ngaro. Ka waiho te kōrero whakamutunga nei nā Pāpā Wīremu. I will conclude this thesis with Uncle Bill's words:

Ka noho au me ngā kōrero hai tuku ki a rātau. Ka mōhio ka tare au ka whakanoho rātau e manako ana rātau e hoki mai ana ki te kāinga, e noho mātau te kōrero i ngā kōrero o Whiro. E noho mātau ki te kōrero i ngā kōrero o Māwharu, o Tangaroa, o Tamatea, Ōrongonui. Nā reira, ko te arohanui, ka hokihoki rātau ki ō rātau nei kāinga, ki ā rātau mahi i roto o Tāmaki makaurau, i hea atu, i hea atu. Ka mutu tā mātau noho tahi, me ā rātau kūmara, me ā rātau kōrero. Engari, ki te kī rātau, me whakahoki anō a tērā tau, ko koa ahau, nā te mea, ka hoki mai anō rātau, ka tikina ngā kōrero o te maramataka, ka tikina ngā kōrero o Matariki, ō wai atu, ō wai atu. Ka haere mātau ki te moana, ki te mahinga kai o te moana, ki ngā awa, ki te mahinga kai ki te ruku. Ki tōku whakaaro hai reira, ka tupu anō te tino rangatiratanga o te whānau hai tūtaki i ngā whakataetae o te awa i whakarewa nei i a tāua i roto i ngā taone nūnui. I ngā wā kua kōrero au ki a rātau, tō rātau hiahia te rongoa ahau e matekai ana i ngā kōrero, ana he mea pai tēnā. Ahakoa ehara i te mātauranga Pākehā, engari he mātauranga tūturu Māori. Kia tū rangatira ai rātau i tō rātau ao i waho rā. Koinei tōku wawata, koinei tōku koa, koinei tōku tūmanako. Nā reira, ka whakatikatika ahau i ahau kia mau ngā kōrero hai pū te wā kia tuku ki a rātau. Koirā noa iho tōku wawata itiiti noa nei (W. Tāwhai, personal communication, 25 May 2005).

Hikitia, hikitia te rongomaiwhiti o tēnei wānanga, o tēnei tuhinga. Tukua kia ea, tukua kia oi. Ko Ranginui e tū iho nei, ko Papatūānuku e takoto nei. Turuturu o whiti, whakamaua kia tina, tina. Haumi e, hui e – tāiki e!

Heoti anō, kei aku nui, kei aku rahi, tēnā hoki tātou katoa.

He Āpitianga - Appendices

NGĀ INGOA O NGĀ KĀIKŌRERO – NAMES OF PARTICIPANTS³¹³

Hauraki

1. Betty Williams
2. Dicky Rakena
3. Haumarangai Conners
4. Huhurere Tukukino^π
5. John Tūhoe
6. Kemara Tukukino
7. Lionel Richards
8. Matekino Royal^π
9. Mita O'Brien^π
10. Moemoana Williams
11. Taimoana Tūroa^π
12. Te Hiringanuku Ngāmane^π
13. Tewi Nicholls
14. Toko Renata
15. Tomo Baggs
16. Walter Baggs
17. Wati Ngāmane^π

Te Whānau-a-Apanui

1. Addie Waititi^π
2. Apanui Ngāmoki Skipper^π
3. Areke Skipper^π
4. Arthur Waititi^π
5. Blythe Rodgers^π
6. Danie Poihipi
7. Dave Demant^π
8. Emma Rogers^π
9. Grace Kemara^π
10. Hati Tangira Skipper^π
11. Hiria Hedley^π
12. Hopaea Ngātoro^π
13. John Hātepe Skipper^π
14. John Waenga^π
15. Kawa Ingārangi Huritū^π
16. Molly Demant^π
17. Roka Paora^π
18. Tahanga Kemara^π
19. Wīremu Karuwahā Tāwhai^π

Ngāi Tahu Whānui

1. Aaron Riwaka
2. Aperehama Kipa
3. Brett Cowan
4. Bubba Thompson
5. Cyril Gilroy
6. Dean Whaanga
7. Donald Couch
8. Estelle Leask
9. Gail Tipa
10. George Haremate
11. Georgina Tainui
12. Graham Tiny Metzger
13. Hana Morgan
14. Helen Rasmussen (nee Wilson)
15. Hemi Mason Russell
16. Jan Hanrahan (nee Wilson)
17. Jasmine Stewart
18. Joseph Hullen
19. Karl Russell
20. Khyla Russell
21. Mandy Waaka-Homes
22. Maria Pera
23. Mātakiwi Wakefield
24. Maurice Manawatu
25. Michael Skeritt
26. Miriama Johnson
27. Paul Wilson
28. Phyllis Papworth
29. Rānui Ngārimu
30. Renald Butch McDonald
31. Rewi Anglem
32. Tā Tipene O'Reagan
33. Taare Bradshaw
34. Taewa Hector Tuhura Tainui
35. Te Maire Tau
36. Te Rua Mason
37. Te Wera Poharama
38. Terry Nicholas
39. Tui Williams
40. Yvette Couch-Lewis

³¹³ π - Kaumātua/informants who provided information prior to the commencement of this thesis

Research Project Title: Te Kawa Tūpanapana i ngā hau tūpua a Tāwhiri-mātea – The Validation, Revitalisation and Enhancement of Māori Environmental Knowledge of Weather and Climate.

Researcher: Apanui Skipper (Te Whānau-a-Apanui, Ngāti Tamaterā, Ngāti Raukawa, Te Aitanga-a-Mahaki, Ngāti Toa, Ngapuhi)

Address: National Institute of Water and Atmospheric Research Ltd, Gate 10, Silverdale Road, Hillcrest, Hamilton, P.O. Box 11115, Hamilton.

Ph: (07) 859 1827 (027) 271 4975 Fax: (07) 856 0151 Email: a.skipper@niwa.co.nz

1. What is the research study about?

The Research Study focuses on collating raw data for the PhD through the School of Māori and Pacific Development (SMPD) - Te Whare Wānanga o Waikato, which is based on existing research that explores a body of knowledge that has been coined Māori Environmental Knowledge (MEK King et al, 2007) or Mātauranga Taiao Māori (MTM) of weather and climate. The overall aim of the research is to investigate the hypothesis that Māori had a sophisticated, robust knowledge, understanding and expertise of weather and climate before the arrival of European immigrants to New Zealand.

2. What is the rationale for this study?

Indigenous Knowledge practitioners and experts are like many endangered species around the planet, they are on the brink of extinction. In Aotearoa, New Zealand Māori elders or kaumātua are no different. Every kaumātua lost is felt keenly not only by their own hapū and iwi but by the whole Māori nation. In the last couple of years Tamati Paraone (Ngāti Hine), Fred Porima (Ngāti Hikairo), Ching Te Hau-o-te-rangi Hamiora Tutua (Ngāti Awa, Ngāti Tūkorehe and Parehauraki), Hohepa Kereopa (Ngāi Tūhoe) and John Rangitihiri Rangiwaiata Tahuparae (Whanganui, Te Arawa, Tūwharetoa, Ngāti Apa, Rangitāne, Taranaki) passed away; more recently Wharetoroa Bob Kerr (Ngāti Mahuta), Te Āue Davis (Ngāti Maniapoto), Hone Haunui (Waikato, Ngāti Maniapoto), Roka Paora (Te Whānau-a-Apanui); and my uncle and mentor Wīremu Karuwha Tāwhai (Te Whānau-a-Apanui) who assisted with the preliminary research that led to this PhD; ten kaumātua who were repositories of spiritual tribal lore are gone forever.

The greatest issue of our time facing mankind is without a doubt climate change. Historically research to date in Aotearoa has involved the practice of researching Māori Knowledge based on a Eurocentric worldview. Western Science may have a good understanding about the natural world but cannot provide all the answers. Hence the rationale for examining what Māori elders know about weather and climate due to the fact that localised Māori knowledge still remains to a large extent an ignored body of knowledge and expertise by mainstream society and associated science institutions in New Zealand. Initial efforts to source any published literature on this subject has been negligible, save recent pilot work conducted by the Māori Environmental Research Team (Te Kūwaha) at the National Institute of Water and Atmosphere (NIWA); otherwise only short narratives that hint at much more have been found.

³¹⁴ My original PhD Research Information Sheet

Consequently this research will investigate the hypotheses that Māori had a sophisticated, robust knowledge and understanding of weather and climate before the arrival of European immigrants to New Zealand. This body of knowledge forms part of what has been coined Māori Environmental Knowledge (MEK) or Mātauranga Taiao Māori (MTM) of weather and climate (King et al, 2007). Due to the fact that many of the elders that were initially identified to be interviewed have now passed away, a greater sense of urgency is required to undertake this research to ground truth, to consolidate and carefully document the level of localised understanding of weather and climate knowledge throughout Aotearoa.

This enquiry will be supported through NIWA's FRST funded programme – Adaptation to Climate Variability and Change (ACVC). It will contribute to the larger 'Benefit to Maori' objective by building upon earlier work that explored the nature and character of MEK of local weather and climate change with iwi partners Te Whānau-a-Apanui and Ngāti Parewahaika from Te Umangawha-o-nga-waka - Parehauraki. Therefore this research study will explore the nature of the knowledge gap between MEK/MTM of localised weather and climate and mainstream weather and climate forecasting and investigate whether or not it is possible for both streams of knowledge to complement each other. There is a crucial need to:

- collate MTM throughout Aotearoa before it is lost;
- create an effective dialogue space at the interface between MTM and science/climate forecasters;
- contribute to the evolution and advancement of MTM by promoting and developing its relevance in Kohanga Reo, Kura Kaupapa and Whare Kura;
- provide parallel knowledge systems in regards to current science curriculum to underpin the importance of MTM revitalisation; and
- utilise Māori media outlets, i.e. Te Kaea - Māori Television, to promote Māori Weather and Climate indicators and observations atleast tri-monthly.

3. What will the participants have to do and how long will it take?

Key kaumātua who are recognised for their expertise MEK of weather and climate from throughout Aotearoa will be contacted and invited to participate in this research programme by letter. A PhD Research Information Sheet that briefly summarises the research will be included. Where permission is granted a date, time and venue will be agreed upon. All participants will be fully informed about the research and then they will be asked to sign an Ethics Research Consent Form prior to the interview taking place. The interview process will be approximately one and a half hours duration.

The technology used to record the one on one interviews are either a high quality digital dictaphone or a digital video recorder to ensure clarity of sound and picture, whatever option is acceptable to them. Aerial and topography maps will be supplied (if needed) to participants to assist with location and an explanation of customary activities. These one on one interviews will involve semi directed questions around six key themes guided by the researcher lasting approximately 1.5 - 2 hours each. The six key themes are as follows:

- Ngā Tohu Huarere/Āhuarangi (localised weather and climate indicators/prediction/forecasting and spiritual phenomena);
- Whakapapa / Classification / Place Names (clouds, rain, wind);
- Maramataka/Ngā Marama me ngā Kaupeka o te tau (Māori Lunar Calendar/Almanac);
- Pūrākau/waiata (oral stories/tribal songs);
 - Tohungatanga (esoteric/cabalistic/metaphysical knowledge and training/creation of new knowledge);

- Once all one on one interviews have been completed, the audio files/data obtained from these interviews will be transcribed, collated and then analysed. Each individual participant will be given the option whether or not they want their own transcriptions and recordings back. At the completion of the research all data will be removed from the researcher's computer server and a full summary of the research findings will be provided to all participants. Both national and international sources of literature pertaining to indigenous/traditional and western weather lore and weather and climate prediction will be collated. International literature sources (e.g., via the internet) are important as they will add value to this research by providing historical comparisons of indigenous weather and climate forecasting knowledge systems, and potentially, knowledge of internationally relevant historical weather and climate phenomena and trends.

Data from these wānanga will be analysed separately and the agreed workshop material will then be collated, reviewed, and compiled to represent the MTM of each rohe for the purpose of fulfilling the requirements of the PhD dissertation.

Refer above, but all information collected during conversation/meetings/ wānanga will only be viewed by the researcher and the Research Team and will remain strictly confidential. Participants will also be given access to a summary of the findings from the study, when it is concluded.

Participants will voluntarily and openly consent to participation in this research project and will have an opportunity at any time before, during or after the completion of the project to withdraw partly or completely from the research project. Participants will have the right to any kind of confidentiality and anonymity they require to feel comfortable about participating in this research project. Individuals will not be identified in any publication/dissemination of the research findings without their explicit consent.

Main Supervisor: Professor Dr Linda Smith
Assistant Supervisor: Professor Pou Temara
Assistant Supervisor: Dr Charlotte Severne
Assistant Supervisor: Wiremu Tawhai

Date: / /

PHD RESEARCH QUESTIONS

1. Whakapapa – Life history:

- Tēnā koe, firstly can you tell us about yourself?
- Where are you from & what are your hapū / iwi affiliations to this place?
- How long have you lived in this area?

2. Local weather and climate conditions:

- What is your understanding of local weather patterns here?
- What direction does the prevailing wind blow from?
- Are there any weather 'peculiarities' in this area? (i.e., Nor'easterly)
 - Why is it different?
 - Does it have a name?
 - When does it usually appear?
 - What does it mean to your people?
 - Can you tell me anything more about it?

3. Worldview:

- Can you explain to me local worldview?
- Is this worldview held throughout Hauraki?

4. Te Ao Wairua:

- Can you recollect any reference from your elders about Te Ao Wairua and weather?
- What about tohu that is associated with Te Ao Wairua? (lightning strikes on the peaks of sacred mountains, double rainbow or descending fog on certain hills) Tohu aituā / tohu mate / Makutu?
- Do you know any stories that involve the use of karakia to raise storms or to cause rain to fall, or stop rain from falling?

5. Ngā Maumaharatanga:

- How were your people able to remember warnings about the weather?
- Can you remember any examples?
- Do you know any kōrero or pakiwaitara regarding the weather?
- What about whakataukī or proverbs concerning the weather?
- Are there any local Māori place names that are associated with weather or risks to life due to bad weather conditions, such as Waikino, Haumate, Wawa-waiāu?

6. Ngā Whakarōpūtanga:

- Do you know any Māori names for winds, clouds, rain, rainbows, lightning and thunder? (Galeforce, high, med, low, breezes, heavy rain, shower, light rain)
- What wind direction brings rain, storms, fine weather or snow?

7. Ngā Tohu Huarere, Āhuarangi, Wāhanga-o-te-tau (What, where, how, efficacy):

- How did whānau in the past know when there was going to be changes in the weather and climate conditions? (For example in other places, the clouds and mountains, stars, moon, flowering trees, migrating birds, birds crying, animal behaviour).

- What are the tohu / environmental indicators (clouds and mountains, stars, moon, flowering trees, migrating of birds, birds crying, animal behaviour) you use to predict the weather?
- What are some examples of local traditional weather prediction? What are some examples of local traditional climate (long range weather) prediction?
- Can you show me on a map where this phenomena takes place?
- Are these tohu - signs still reliable?
- And after seeing the tohu how long does it take to arrive?
- Are there any tohu which are still remembered that warns of extreme weather? (violent storms, gale force winds, blizzard, snowfall, flooding, and drought).
- Do the locals still believe in these tohu for their protection?
- How many seasons are there and what are their names? What are the seasonal tohu that let you know that a change in season is about to take place? Or that a particular food will be available?

8. Tirohanga Whānui:

- What are your views on climate change?
- Can you tell us about any changes in weather and climate conditions that you have observed in your lifetime?
- Are you concerned with these changes taking place and if so what are those concerns? Have you thought about what it might mean for your people? Can you explain why?

9. Akoranga:

- Can you explain what type of skills and training are needed to survive weather extremes? How are these skills taught? Inclusive or exclusive?

10. Whakaritenga Taputapu:

Can you identify any tools that were used to assist accuracy? What do you know about the maramataka? Do you use the Maramataka or Lunar calendar? If so, what does the maramataka have to say about these changes taking place?

11. Revitalisation:

- Are you supportive that this body of localised weather and climate knowledge is restored and why? Do you have a view how this knowledge can be restored? What are your thoughts about this body of localised weather and climate knowledge being incorporated into schools to help protect it from being lost?
- Is there anything else that you would like to see happen or say to the future generations yet to come?

Nō reira e te matua / whaea, e te pā whakawairua, tēnā rawa atu.

HE KUPUTAKA - GLOSSARY

Ahi-kā-roa	Long term settlement
Aitu-ā	Misfortune
Āniwaniwa	Rainbow
Ariki	Paramount Chief
Āta whakarongo	Listening attentively
Atua	God
Autahi	Canopus
Awa	River
Awhā	Storm, tempest
Hākari	A feast whereby tangata whenua can express manaakitanga for their visitors and thus return them from a state of tapu to a state of noa
Hākoakoa	Fluttering Shearwater (<i>Puffinus griseus</i>)
Hapū	Sub-sections of tribes
Harakeke	NZ Flax (<i>Phormium tenax</i>)
Hau	Generic name for wind
Haumia-tiketike	God of uncultivated foods
Hawaiki	A term coined for a place that had been left behind by Polynesian migrants
Hine-pūkohu-rangi	Goddess of the mist and fog
Hine-te-wai	Rainbow mother (Ngāi Tahu)
Hui	Congregation, meeting
Huihuinga	Communal gatherings usually held at the marae
Hao (Ngāi Tahu)	Tuna
Ioraki (Ngāi Tahu)	Mares cloud, high cirrus clouds
Iwi	The Māori tribal nations of Aotearoa each descended from an eponymous ancestor of whom the iwi is sometimes named after
Kāeaea	NZ Falcon, bush hawk (<i>Falco novaeseelandiae</i>)
Kahukura	Rainbow God (Ngāi Tahu). The upper band of the rainbow is male called Kahukura-pango. The lower band is called Rokomai
Kāhuru (Ngāi Tahu)	Autumn
Kaimoana	Seafood
Kāinga	Home or describing the homes of tangata whenua
Kaitiaki	Guardian
Kaitiakitanga	Guardianship, preservation, conservation, protection, fostering
Kā Kurakura-o-Hine-nui-te-pō (Ngāi Tahu)	Aurora australis, southern lights
Kanakana (Ngāi Tahu)	Lamprey (<i>Geotria australis</i>)
Kapo (Ngāi Tahu)	Sheet lightning
Kapua	Generic name for cloud
Karae (Ngāi Tahu)	Rain Bird (<i>Procellaria weslandica</i>)
Karakia	Prayers or incantations addressed to the gods, and are offered so that the gods may intercede in the affairs of mortal beings by providing comfort, guidance, direction and blessings for them in their various activities and pursuits
Kārewarewa (Ngāi Tahu)	NZ Falcon, bush hawk (<i>Falco novaeseelandiae</i>)
Kaumātua	Tribal elders who speak on behalf of their hapū and iwi
Kaupapa Māori	Self-determination, cultural aspiration, culturally preferred pedagogy, socio-economic mediation, extended family structure, and collective philosophy

Kauwae Raro	Terrestrial knowledge
Kauwae Runga	Celestial knowledge
Kiekie	(<i>Freycinetia banksii</i>) Native climber. Edible fruit and the leaves used for weaving
Kiwa	Lesser god of the ocean
Kōanga	Spring
Koekoeā	Long-tailed cuckoo (<i>Eudynamys taitensis</i>)
Kōhai (Ngāi Tahu)	(<i>Sophora tetraptera</i>)
Kōhanga ika	Nursery grounds for fish
Kōparapara	Bellbird (<i>Anthornis melanura</i>)
Kōtuku	White heron (<i>Ardea modesta</i>)
Kōtukutuku	NZ Fuchsia (<i>Fuchsia excorticata</i>)
Koukou	Morepork (<i>Ninox novaeseelandiae</i>)
Kūaka	Godwit
Mahinga kai	Traditional shellfish gathering areas
Mahinga mātaītai	Traditional food gathering areas
Makariri (Ngāi Tahu)	Cold, winter
Mana	Mana is central to the relationships between individuals or collective groups or both; tangata whenua are responsible for ensuring that the mana of visitors is maintained; whānau members, young and old, are responsible for upholding the mana of their whānau
Manawhenua	An intimate interconnected relationship with the land
Manaakitanga	Is to care for a person's mana. Manaakitanga, therefore, means to care for a person's well-being in a holistic sense – that is physically, mentally, spiritually and psychologically. The mana of the host rises or falls on their ability to be generous hosts to their guests
Manuwhiri	Visitors, guests
Marae	The open area in front of the wharehau (main meeting house), where formal greetings and discussions take place. The term is also used to describe the communal facilities which are symbols of whānau and hapū identity
Marae-ātea-a-	Area directly in front of a traditional meeting house, a sacred place
Tūmataūēnga	
Marama	Moon
Marama korohiti	New Moon
Marama ohua	Crescent Moon
Maramataka	Lunar environmental calendar
Marangai	Driving rain, almost horizontal, downpour
Mātaītai	Shellfish, seafood. It is also an area of traditional fishing grounds which may encompass more than one. A spatial closure for the purposes of helping recognise use and management practices of iwi and hapū in the exercise of non-commercial fishing rights
Matāmua	Eldest
Mātauranga Taiao Māori	Māori environmental knowledge (MEK)
Mātauranga Māori	Māori knowledge – see Ūpoko Tuaono
Maunga	Sacred mountains. Iwi identifies with a specific mountain that has special significance to them. Tribal pride, mana, and authority are synonymous with these mountains
Maunga hikonga ūira	Usually two bolts of lightning striking the summit of a sacred mountain – a sign of impending death of a tribal leader

Mauri	Life force, life essence of all things animate and inanimate
Moana	The coastal waters of iwi and hapū
Mōhua	Yellowhead (<i>Mohoua ochrocephala</i>)
Namunamu	NZ Sandfly (<i>Austrosimulium unqlatum</i>)
Naonao	Midge (<i>Chironomus zealandicus</i>)
Ngāhuru	Autumn
Ngā Pō Marama	Lunar cycle
Ngā Whenu-Tapu-e-Waru	‘Eight sacred strands’, a conceptual framework that I have developed to better understand MEK
Noa	Free from tapu or any other restriction. Profane, ordinary, without restraint, or denoting an absence of limitations or conditions
Ohonga	Physical representation of the <i>oho</i> - anything that has been associated with the person for whom the <i>karakia</i> is intended, e.g. a lock of hair.
Pā	Fortified villages
Paia (Ngāi Tahu)	Easterly blowing more than a week
Pakanga	Battlefields, sites where blood was spilt during battle
Pakeke	Tribal elder, adult, older generation
Pāoa	Smoke
Paoro-rimu-huarere	Kelp weather glass
Papakāinga	Tribal, communal villages
Papatūānuku	Earth mother, wife of Ranginui
Pararā (Ngāi Tahu)	Broad-billed Prion (<i>Pachyptila vittata</i>)
Pātaka kai	Traditional food gathering sites. It also refers to storage houses for seasonal food which is harvested when in plentiful supply. See mātaītai.
Pātōtara (Ngāi Tahu)	Dwarf Mingimingi (<i>Leucopogon fraseri</i>)
Pepeha	Tribal saying that connects an individual to a sacred mountain, river, sea, canoe, eponymous ancestor, and a tribe
Pīwakawaka (Ngāi Tahu)	Fantail (<i>Rhipidura fuliginosa</i>)
Pipiwaharoa	Shining cuckoo (<i>Chrysococcyx lucidus</i>)
Poraka	Brown Tree Frog (<i>Litoria ewingii</i>)
Poroporo	Māori Gooseberry (<i>Solanum aviculare</i>)
Pōwhiri	Ritual encounter during a traditional welcome
Puaka (Ngāi Tahu)	Rigel
Pūawānaka (Ngāi Tahu)	NZ Clematis (<i>Clematis paniculata</i>)
Pūrākau	Traditional tribal narratives
Pure	To remove tapu, purification rite
Pūtakitaki (Ngāi Tahu)	Paradise Duck (<i>Tadorna variegata</i>)
Rāhui	A form of tapu restricting the use of land, sea, rivers, forests or other natural resources. It can be used to restrict entry, replenish resources or allow the tapu associated with death to dispense naturally by the natural elements of the air, sun, and rain
Rākaunui	Full Moon
Rangatahi	Youth, younger generation
Rangatiratanga	Sovereignty, chieftainship, right to exercise authority, chiefly autonomy, chiefly authority, ownership, leadership of a social group, domain of the <i>rangatira</i> , noble birth, attributes of a chief
Ranginui	Sky father, husband of Papatūānuku
Rarohenga	Underworld, dwelling place of the dead
Rātā	Southern Rātā (<i>Metrosideros umbeelatum</i>)

Raumati	Summer
Rimurapa	Bull Kelp (<i>Ecklonia radiata</i>)
Rehua	Antares
Riroriro	Grey Warbler (<i>Gerygone igata</i>)
Rohe	A boundary or boundaries
Rongo-i-amo	Lesser deity of the rainbow god (Ngāi Tahu)
Rongoā	Traditional medicine, natural remedy
Rongomai	Rainbow Guardian. This god resides on the moon. The gods in this family are guardians of the rainbow bridge that leads through the heavens
Rongo-mā-tāne	God of cultivated foods
Rua kanapu, koha	Usually two bolts of lightning striking the summit of a sacred mountain – a sign of impending death of a tribal leader
Ruahine	Female seer, eldest female from a family of rank
Ruaimoko, Ruaumoko	Earthquake God
Ruanuku	Seer, wise man, priest
Rūnanga, rūnaka	Tribal council
Tahupokai (Ngāi Tahu)	Red Sky
Taipua (Ngāi Tahu)	Dark, towering billowing clouds, cumulo-nimbus
Takata-wairua (Ngāi Tahu)	Ghost Moth (<i>Heloxycanus patricki</i>)
Take Raupatu	Conquest
Takiwā	A district or space
Takurua	Winter
Tama-nui-te-rā	Sun
Tama-te-ūira	God of lightning
Tāne-rore	Son of Tama-nui-te-rā, mirage, shimmering heat waves
Tangaroa	God of the ocean
Tangata whenua	People of a particular district
Tangihanga	The mourning ceremonies and rituals preceding and including a funeral
Taonga	Property or anything highly prized
Tāpae	The act of dedication; consisted of offering up a person, place or thing to the service of a particular atua
Tapu	Is a sacred condition of restriction, affecting persons, places, and things, and arising from innumerable causes. People need to be cautious that their actions do not affect the tapu of others. Similarly, people need to be careful that others do not affect their tapu
Tarahaoa	Mt. Peel
Taunga-moki	Moki fishing grounds
Tauranga ika	Traditional fishing grounds for finfish species
Tauranga waka	Places where ancestral waka (canoes) landed after long voyages, and also refers to traditional places where waka were brought ashore after returning from a voyage. Ideal canoe landing sites are flat so that minimal stress is placed on the hull of the canoe
Tāwhiri-mātea	God of storms and tempests
Te Ao Kikokiko	Physical world
Te Ao Wairua	Spiritual world
Te Ika-a-Raki (Ngāi Tahu)	Milky Way
Teina	Younger brother or younger sister
Te Māuru (Ngāi Tahu)	North-west Arch and Nor'wester
Te Taiao	Environment

Tieke	Saddleback (<i>Philesturnus carunculatus</i>)
Tikanga	Best practice, rules, customs, reasons, and meanings
Tī kouka	Cabbage Tree (<i>Cordyline australis</i>)
Tītī	Muttonbird
Tohi	Sacramental rite of initiation
Tohu	Sign, environmental indicator
Tohunga	Priest, adept, expert
Tohunga whakaterere waka	Expert Polynesian navigator
Toi whenua	Original inhabitants, first nations
Toka (Ngāi Tahu)	Southerly
Torea	Pied Oystercatcher (<i>Haematopus ostralegus finchii</i>)
Tōrino	Ear drum
Tuakana	Elder brother of a brother, or elder sister of a sister
Tūkapua	God of Clouds
Tūmataunga	God of war and mankind
Tūpoupou (Ngāi Tahu)	Hector Dolphin (<i>Cephalorhynchus hectori</i>)
Tūpuhi	Storm
Tūpuna	Ancestor
Ua	Rain
Uenuku	Celestial Rainbow God.
Ūira	Lightning
Umu	Either a lunar halo or a solar halo
Umu Kohukohu	A special hangi dedicated to the gods
Urupā	Burial sites or cemeteries
Utu	Revenge
Wahanui (Ngāi Tahu)	Norwester
Wāhi tapu	Places which are sacred to tangata whenua, and may include burial sites, grounds where battles were fought, or sites of a highly spiritual nature which may be associated with healing, childbirth or other special purposes
Wairua	Spirit associated with all animate and inanimate objects
Waka hourua	Double-hulled, voyaging canoe
Wānanga	The practice of traditional esoteric or higher learning
Weka	(<i>Gallirallus australis</i>)
Whakapapa	Genealogy. The ability to know one's whakapapa and how iwi and hapū are connected by blood to other iwi and hapū is critical
Whakaterere waka	Navigation
Whakawhanaungatanga	Expression of kinship, and bringing people together through close family associations
Whānau	Immediate family group
Whanaunga	Relatives
Whanaungatanga	Expression of kinship, and bringing people together through close family associations
Whare kura	Tribal institution
Whare mauri (Ngāi Tahu)	Highest tribal institution
Whare wānanga	Tribal institution for higher learning
Whatitiri	Thunder god
Whenua	The land. Māori are inextricably linked to the whenua. They view the whenua as their mother that provides the sustenance that they need to survive

NGĀ MOMO KARAKIA MŌ TE HUARERE – TYPES OF WEATHER INCANTATIONS

The following are a collection of karakia that were used to manipulate the weather. It concludes with an account of the actions of Waikato tohunga who were charged by Kīngi Mahuta to demonstrate their abilities to calm and cause a storm.

This is explanation in Māori regarding the process tohunga from Ngāi Tūhoe would use to weaken the winds from blowing (Best, 1972, p.889):

Ko te umu puru rangi, he karakia tēnā e purupurua ana i ngā hau kia mutu, mehemea he rangi kino, he tuaumu i te rangi. He toko i ngā hau kia haere he wāhi kē. Muri iho ka purupuru. He karakia patu rangi tēnei, he patu i te rangi kino. Ka mutu tēnei, ka kohukohu, mā te wahine tēnā. Mehemea ko Tūtakangahau te hau, mā taku tamaiti wahine, mā Ripine hai kanga kai Maunga-pōhatu, kai Te Whaiti ko Kuoro. I whakaara ahau i taua hau. Ka karanga te tangata. "E hine! Kangaia atu te rangi nei." Ka mutu tēnā, kātahi ka karakia i te tuaumu, te tuaumu rangi

HE KARAKIA TOKO I TE HAU

(Best, 1972, p. 888)

*Tokona ngā hau, tokona ki waho
Tokona ngā hau, tokona ki uta
He toko uri, he toko tea
He māpuna, he kai ure
Kai ure, kai ure!*

HE KARAKIA PATU I TE HAU - PURURANGI

(Best, 1972, pp. 888-889)

*Pokokohua, pokokohua!
Riri – e! Riri – e!
Riri te rangi i runga nei
Riri ngā hau!*

HE KARAKIA PATU I TE HAU - TUAUMU

(Best, 1972, p. 888)

*Te umu hā te ruhi
Hā te pārō, hā te ngenge
Ka tineia kia mate
He ika ka ripiripia
He ika ka toetoea
He ika ka haparangitia*

HE KARAKIA MIRI I TE MOANA ME TE HAU

If the wind continues blowing for several days and becomes a storm, peoples safety is at risk, i.e. flooding, slips, trees falling, houses being destroyed. Tohunga would act to

cause the storm to abate by standing in the water with a piece of charcoal from the fire in his left hand and pass it under his thigh. Only a light breeze would remain. To calm a storm at sea the tohunga would stand on the beach, or if at sea, in the centre of a waka, and, holding a hoe in his right hand, karakia the following twice (Best, 1972, pp. 889-890):

*Hika atu rā taku ahi
Ki te hau e riri mai nei
E rotu mate, rotu mate āiō
He tawaha ana rā te hau e riri mai nei
E rotu mate, rotu mate āiō
He marangai rā te hau e riri mai nei
Haere i tūā, haere i waho
Haere i te moana nui
Haere i te moana roa
Haere i te moana i takiritia
Ki te whai ao, ki te ao marama
Ka uru te mate, ka uru ki waho'
Ka uru te ora, ka uru ki roto
Korou ora!*

HE KARAKIA WHAKAEO

This is a karakia that is recited with a storm overtakes a waka (Best, 1972, pp. 890-891).

*Ko wai rā te hau e riri mai nei?
E ko Uru-kāraerae
Haere i tua, haere i waho
Ko wai rā te hau e riri mai nei?
Ki Te Aputahi-a-pawa
Haere i tua, haere i waho
Ko Tūtara-kauika te atua e patu nei
Haere i tua, haere i waho
Te Tahi-o-te-rangi – e
Kawea ake au ki uta rā
Tūtara-kauika i waho rā
Kawea ake au ki uta rā
Ki te whai ao, ki te ao marama
Torohei*

HE KARAKIA OHORANGI

At the completion of the karakia two stones are struck together, then they thrown skyward. The voice of Hine-te-whaitiri was heard in the heavens. Now, if the peal of thunder was heard in either the east or north it was a good sign. However, if the peal of thunder was heard in the south or west it was a negative sign (Best, 1976, p. 361):

*Tēnei au he kau tū, he kau noho
He kau aro ki a koe, e Tāwhiri-mātea i runga nei!
Papa, papa tahi nuku, papa tahi rangi nāu e Whaitiri!
He murimuri aroha ki tēnei tama nāu e Tama-te-ūira!
Taua i te itu, taua i te mauri*

*Taua i te iho o tō tama ariki
Ki tēnei pia, ki tēnei aro nōu e Tāwhiri-mātea...e...i!*

HE KARAKIA OHORANGI

(Best, 1972, p. 880)

*Ka oho te pō
Ka rongo te pō
Ka rongo te ao
Ka oho ki tua
Ka oho ki waho
Ka oho ki ngā koromatua*

HE KARAKIA MŌ TE UA KIA MAO

(Te Ahu, 1854, p. 97; Grey, 1853, p. 292):

*Tua koi rangi nui, koi rangi roa,
Koi rangi pouri, koi rangi pōtango
Koukou te whetū i runga nei
Moana rōpū kei tai
Kei tai e riri ana
Tū mai āroi
Kei tai e patu ana i te hau
Tū mai aroi
Pūnganangana
Pūnganangana
Puaka haua te tawhito o te rangi
He Uru rā ko te hau
He tonga rā ko te hau
Ka hara mai ka tinei
Ka tinei kia mate
Toki nui te toki, toki roa te toki
Toki tāwāhie te toki
Ka whanatu au, ka hahau i te takapu o te rangi
E riri mai nā, e nguha mai nā
Ka hinga, ka mate, hau mate.
Whakataka te hau ki te uru
Whakataka te hau ki te tonga
Kia tū māhinahina i uta
Kia tū mārokeroke i tai
Kia ao ake te rā
He tio, he keo, he hauhūnga*

HE KARAKIA WHĀNGAI WHETŪ

When the people began their seasonal work of planting crops they were careful first to invoke the aid of the food giving stars so that all food crops might flourish, and pests and diseases be prevented. The priest first gathered a quantity of the leaves of the young plants. These were taken to the tūāhu or the sacred place of the pā and there offered to the stars while the priest recited (Mitchell, 1972, p. 236):

*Tūpurupuru atua e-e
 Ka eke mai i te rangi e roa e-e
 Whāngainga ki te mata o te tau e-e
 Atu tahi [Atutahi?] atua
 Ka piki mai i te rangi e-e
 Whāngainga iho rā ki te mata o te tau e-e
 Tuku rua atua
 Ka eke mai i te rangi e tū nei e-e
 Whāngainga iho rā ki te tomairangi e-e
 Whānui atu
 Ka eke mai i te rangi e popoki nei e-e
 Whāngainga iho rā ki te matomato e-e
 Ki te hau ora e-e*

HE KARAKIA WHAKAMUTU I TE UA – PURERANGI, TUA-I-TE-RANGI

If a tohunga wanted to stop the rain from falling, he would face the storm and chant the following (Best, 1972, p. 883):

*Tua kai te rangi tuatahi
 Tua kai te rangi tuarua
 Tua kai te rangi i tukitukia
 Haere ana te pō
 Haere ana te mao
 Oi whiwhia, oi rāwea
 Hika atu rā taku ahi
 Ki te ua e riri mai nei
 E rotu mate, rotu āiō he
 Haere te pō ki uta
 Haere te pō ki tai
 Haere te pō ki waho
 He huenga nuku, he huenga rangi
 Ka mao ki uta, ka mau ki tai
 Ka mao te rangi e tū nei
 Ka puta ki te whai ao, ki te ao marama
 Korou ora.*

HE KARAKIA KIA MUTU TE WHATITIRI

If it were necessary to cause a thunderstorm to finish and the sky to clear, the priest would stand and recite the rite called Whakaū (Best, 1972, p. 881):

*Kāti e Rangi
 Whakataha rā koe e te anewa o te rangi e tangi nei
 Kei whara koe i te mamaru o te rangi e tū nei
 Te tawhito tō tapu e tangi nei koe
 Nā te tapu ahi, nā te tapu mana
 Hinga ki mua
 Takoto ki raro ki tō kauwhau ariki
 Heuea ki uta, he ūea ki tai
 Heuea ki te rangi nui e tū nei*

HE KARAKIA WHAKATANGITANGI I NGĀ TĪPUNA TANIWHA KIA MAURIA KI UTA

If a person was overtaken by a storm while on a waka at sea and was unable to control the elements, he would call upon his ancestor Tūtara-kauika, Ruamano to carry him ashore. He would mentally prepare himself, remove all other thoughts, and standing upright in the waka with the bailer raised high, invoke the following karakia (1972, p. 239):

*Ko wai rā te hau e riri mai nei?
E; ko te uru kāraerae
Haere i tua, haere i waho
Ko wai rā te hau e riri mai nei?
Ko Te Aputahi-a-Kiwa
Haere i tua, haere i waho
Ārai-te-uru e-e, kawea ake au ki uta rā
Ruamano e-e, kawea ake au ki uta rā
Ki te whai ao ki te ao marama
Korou ora!*

HE KARAKIA WHAKAARA I TE HAU

Uttered by Te Rongopatahi. Ka mutu nei te karakia whakaara i te hau, i a 'Huri-moana,' i a 'Huri-pari,' i aia mai te aukume, te auroa ki Aotea-roa nei, kia ngawari ai te hoe mai o ngā waka. Ka mutu rā taua hau nui, ka whakaarahia ko te karakia mō te haere i te moana (Smith & Te Whatahoro, 2011, p. 195):

*Tēnei au, tēnei au kei te uruuru-tipua,
Kei te uruuru-tawhito, nāu, e Tāne-te-matua
I te Pū-matua, i te take, i te Toi-hua-rewa,
Matua i Ara-tiatia, ki Te Uru-o-Manono.
Whai ake, whai ake nei au ki te whai, ko Paroro-rangi,
Unuhia te puru o Huru-rangi,
Kia puta mai koe tuata, tuapou,
Tuata tua-taniwaniwa.*

*Tahuna, tahuna tō ahi,
Ko te ahi kapakapa, ko te ahi rere rangi
Ko te ahi tikawe, ko te ahi torotoro
He ara atu mōu
E Tāwhiri-nuku, e Tāwhiri-rangi
Tēnei tō ahi, ko te ahi nō Titi-matangi nui
Nā Titi-para-uriuri
Tēnei tō ara ki te ihu whenua, ki Aotearoa
Ko te au-kume, ko te au-rona
Ko te au-papa, ko te au-tarere
Ko te au-hokai, ko te au-tūpou
Ki te ihu whenua, ki Aotearoa
He taku, he takao ki tawhiti kia ū atu
Poutina, Poutaka ki te ihu whenua
I Tiritiri-o-matangi
Nā wai taku aro?*

*Nāu e Tāwhiri-mātea
Nāu e Titi-o-matangi-nui
Titi-matangi-roa, Titi-mata-kaka
Hokai-nuku, hokai-rangi ki taku aro
Ka tau ana koe he aro whenua
Ki Tiri-o-te-moana
Whakaotinuku ki tēnei tama, e-i*

HE KARAKIA PUPAKE O WHAITIRI - NĀ NGĀ RAURU

(White, 1888, pp. 71-73)

*Te hengi iti, te hengi nui
Ko te matangi iti, aurutia
Taka tū o te rangi
Eke rawa ake ki runga,
Ka whatiwhati ngā paihau o Rupe
E tawiri ana, e muru ana
I te ngana o te tāhuhu
E whakaturuki ana i ōna parirau
Turuki mai te turuki
Kakapa mai te kakapa.
Hohoka mai te hohoka
Ka oko mai, te manu nui a Rua.
Ka panga, ka okai [hokai?]
I āna tūā [tū a hokai]
Te hengi iti, te kiwa nuku
Te kiwa rangi
Ko te [tō?] mātou kiri
Nāna i rapaki te potaka
Nā utu potaka, rau potaka, rā tai
Tū tina, ko Taki. Tū ko Taki
Tū Taki, ko Te Mane
Tā Te Mane, ko Tai-ratu
Tā Tai-ratu', ko Tai-aro-pai;
Tā Tai-rapa-pai [Tai-aro-pai?]
Ko Pūwhetongitongi; tā Pūwhetongitongi
Ko Te Ninihi; ko Te Parata
Ko Pare-kuku, ko Pare-wawau
Nā Te Nge i raro nei, nā
Hei whare mō ngā atua
Kei ora tai o ngā tāngata
He tai pupū, kei te Piere
Kei te Matata, ko Murimuriāwhā
Hurihūrikeukeu, Takataka-inohi
Whakarongo te tupu, whakarongo te taw[h]iti
Tupua-nuku
Tā Tuhi, ko Te Rapa
Tā Te Rapa, ko Te Ūira
Ko Te Āwhā, ko Warawara-te-rangi
Kū noho i a Roro-te-rangi
Tākiritia ki waho, ko Whaitiri [Ka moe]
Ia Hiakai-tangata*

*Ka puta ki waho, ko Punga, Punga-nui
Punga-roa, Tautau
Tautau-iri, Tautau mā mate
Ko Tūpua rāua ko Taw[h]iti*

KĪNGI MAHUTA

On 30 December, 1909, Mr Henare Kaihau, M.P. for The West Coast (North Island) made a public statement explaining how in 1907 Kīngi Mahuta had asked his relatives, who were tohunga, if they could stop the wind from blowing a gale. The Tohunga responded by putting seven sticks into the ground, and then they fastened light cloth streamers to the tops. The lead Tohunga then recited the whakapapa connection between te ira atua and te ira tangata. That was followed with a very powerful karakia patu i te hau. The winds ceased to blow, and for three days there was not sufficient air to stir the streamers on the poles.

After other requests to provide visible evidence of the power of makutu, Kīngi Mahuta next asked for these tohunga to 'Whakaara ake i te hau' or to raise a gale or storm. The lead tohunga instructed that the marquees be lowered to minimise damage. When volunteers found out why they were taking the marquees down they refused to help. The rest of the tohunga lowered the remaining marquees and tents. Then the lead tohunga started to recite karakia whakaara i te hau. Within a half an hour a wind rose, which speedily developed into a violent storm. Misbelieving whānau and parents fled to take their children to safety. Horrified by the thought that he was the cause of storm, Kīngi Mahuta asked the Tohunga to make the storm go away. This they did, explaining that it would take some time. When asked why, they replied "because we insulted Tāwhirimātea". Although I do not have the names of the Tainui tohunga who did Kīngi Mahuta's bidding, I think that it is important to record this as it provides an example that only 112 years ago, this incident happened in a very public way. It demonstrates that our people had the ability like many other indigenous knowledge holders the mana, and skill to influence the weather.

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